学术英语写作

Scientific Writing

第二章 论文要点

提纲

一 标题

二 作者

三 摘要

一、标题

➢ 例子

Article

III. An instrument, for seeing the Sun, Moon, or stars, pass the meridian of any place. Useful for setting watches in all parts of the world with the greatest exactness, to correct sun-dyals; to assist in the discovery of the longitudes of places, &c.

William Derham

Published: 01 June 1704 | https://doi.org/10.1098/rstl.1704.0015

43个单词

International Journal of Engineering Science
Volume 143, October 2019, Pages 1-13

On modeling of carbon nanotubes reinforced materials and on influence of carbon nanotubes spatial distribution on mechanical behavior of structural elements

Lidiia Nazarenko [a], Aleksandr Yu. Chirkov [b], Henryk Stolarski [c], Holm Altenbach [a]

21个单词

一、标题

➢ 类型

- 报道型：对某一领域的发展动态，某项实验进行通报

[PDF] The COVID-19 vaccine development landscape

TT Le, Z Andreadakis, A Kumar, RG Román… - Nat Rev Drug …, 2020 - researchgate.net

Profile of vaccine developers. Of the confirmed active vaccine candidates, 56 (72%) are being developed by private/industry developers, with the remaining 22 (28%) of projects …

☆ 保存 99 引用 被引用次数：1074 相关文章 所有 10 个版本 »

[HTML] Recent advances in deep learning

X Wang, Y Zhao, F Pourpanah - International Journal of Machine Learning …, 20

With the recent advancement in digital technologies, the size of data sets has bec large in which traditional data processing and machine learning techniques are nc

☆ 保存 99 引用 被引用次数：62 相关文章 所有 3 个版本

一、标题

➢ 类型

- 解说型：对实验、方法、理论等解释或说明

Robust and efficient quadrotor trajectory generation for fast autonomous flight
B Zhou, F Gao, L Wang, C Liu… - IEEE Robotics and …, 2019 - ieeexplore.ieee.org
In this letter, we propose a robust and efficient quadrotor motion planning system for fast flight in three-dimensional complex environments. We adopt a kinodynamic path searching …
☆ 保存 99 引用 被引用次数：129 相关文章 所有 6 个版本

[HTML] Data driven model free adaptive iterative learning perimeter control for large-scale urban road networks
Y Ren, Z Hou, Il Sirmatel, N Geroliminis - Transportation Research Part C …, 2020 - Elsevier
Most perimeter control methods in literature are the model-based schemes designing the controller based on the available accurate macroscopic fundamental diagram (MFD) …
☆ 保存 99 引用 被引用次数：27 相关文章 所有 4 个版本

一、标题

➢ 类型

- 探索型：对方法、理论、观点等进行研究和探索

A novel robust fuzzy integral sliding mode control for nonlinear semi-Markovian jump T–S fuzzy systems

B Jiang, HR Karimi, Y Kao, C Gao - IEEE Transactions on Fuzzy …, 2018 - dl.acm.org

This paper addresses the issue of robust fuzzy sliding mode control for continuous-time nonlinear Takagi–Sugeno fuzzy systems with semi-Markovian switching. The focus is on …

☆ 保存 99 引用 被引用次数：167 相关文章 所有 2 个版本

Fault analysis and debugging of microservice systems: Industrial survey, benchmark system, and empirical study

X Zhou, X Peng, T Xie, J Sun, C Ji… - IEEE Transactions on …, 2018 - ieeexplore.ieee.org

… Our findings also suggest that there is a strong need for more intelligent trace analysis and visualization, eg, by combining trace visualization and improved fault localization, and …

☆ 保存 99 引用 被引用次数：92 相关文章 所有 9 个版本

一、标题

➢ 类型

- 综合型：兼有以上三类的特点

[HTML] Drug treatments for covid-19: living systematic review and network meta-analysis

RAC Siemieniuk, JJ Bartoszko, L Ge, D Zeraatkar… - Bmj, 2020 - bmj.com

Objective To compare the effects of treatments for coronavirus disease 2019 (covid-19). Design Living systematic review and network meta-analysis. Data sources WHO covid-19 …

☆ 保存 99 引用 被引用次数：530 相关文章 所有 21 个版本

Extended state observer-based data-driven iterative learning control for permanent magnet linear motor with initial shifts and disturbances

Y Hui, R Chi, B Huang, Z Hou - IEEE Transactions on Systems …, 2019 - ieeexplore.ieee.org

… Therefore, an iterative dynamic linearization (IDL) method is developed in … rejection control [34] is also a data-driven approach, where … In [37], an adaptive ESO-based ADRC is proposed …

☆ 保存 99 引用 被引用次数：30 相关文章

一、标题

➢ 类型

- 报道型：对某一领域的发展动态，某项实验进行通报；

The Development of the Supersonic Image Analysis in Medicine

- 解说型：对实验、方法、理论等解释或说明；

A Simple and Direct Method for the Latency Change Estimation of Evoked Potentials

- 探索型：对方法、理论、观点等进行研究和探讨；

A New Search for the Wavelet based Neuro-network

- 综合型：兼有以上三类的特点；

A Computer Simulation System for CDMA

一、标题

➢ 如何设计标题？

先拟一个标题，尽量将研究工作的关键信息放进去（关键词、概念、重要方法、重要发现），写成一个完整的句子，然后删除不必要的信息，最后。。。

第一步：Structured Joint Orthogonal Learning for Non-Gaussian Fault Detection

第二步：Orthogonal Learning for Non-Gaussian Fault Detection

第三步：Towards Efficient Orthogonal Learning for Non-Gaussian Fault Detection

一、标题

➢ 格式

- 开头第一个字母大写、专有名词大写，其余均采用小写字母

Automatica 139 (2022) 110171

Contents lists available at ScienceDirect

Automatica

journal homepage: www.elsevier.com/locate/automatica

Iterative learning control for intermittently sampled data: Monotonic convergence, design, and applications☆

Nard Strijbosch *, Tom Oomen

Control Systems Technology Group, Department of Mechanical Engineering, Eindhoven University of Technology, The Netherlands

一、标题

➢ 格式

- 开头的字母、≥5个字母的介词、连词的第一个字母大写

Multi-Task Learning With Coarse Priors for Robust Part-Aware Person Re-Identification

Changxing Ding, *Member, IEEE*, Kan Wang, Pengfei Wang, and Dacheng Tao, *Fellow, IEEE*

一、标题

➢ 格式

◘ 全部字母均大写

SIAM J. CONTROL OPTIM.
Vol. 60, No. 1, pp. 189–209

DYNAMIC EVENT-TRIGGERED LEADER-FOLLOWER CONSENSUS CONTROL FOR MULTIAGENT SYSTEMS*

XIAOQUN WU†, BING MAO†, XIUQI WU†, AND JINHU LU‡

一、标题

➢ 常见问题

- 应该使用名词短语，不该使用一个句子或不定式短语；

高品质封面图

第65卷 (2022)

第12期 (部分)

第11期 (部分)

2022, 第65卷, 第12期

全选 取消选择 引用 下载 PDF

LETTER

Knowledge transferred adaptive filter pruning for CNN compression and acceleration

Lihua GUO, Dawu CHEN, Kui JIA

SCIENCE CHINA Information Sciences **65** (12) , 229101 (2022) https://doi.org/10.1007/s11432-020-3162-4

下载 PDF 在线阅读 收藏 引用 推荐

一、标题

➢ 常见问题

- 一般也不用介词短语等形式；

高品质封面图

第65卷 (2022)

第12期 (部分)

2022, 第65卷, 第7期

全选 取消选择 引用 下载 PDF

RESEARCH PAPER

SAND: semi-automated adaptive network defense via programmable rule generation and deployment

Haoyu CHEN, Deqing ZOU, Hai JIN, Shouhuai XU, Bin YUAN

SCIENCE CHINA Information Sciences **65** (7) , 172102 (2022) https://doi.org/10.1007/s11432-020-3193-2

下载 PDF 在线阅读 收藏 引用 推荐

详情

一、标题

➢ 常见问题

- 标题中也不出现从句；

高品质封面图

第65卷 (2022)

2022, 第65卷, 第5期

全选 取消选择 引用 下载 PDF

RESEARCH PAPER

Efficient distributed algorithms for holistic aggregationfunctions on random regular graphs

Lin JIA, Qiang-Sheng HUA, Haoqiang FAN, Qiuping WANG, Hai JIN

SCIENCE CHINA Information Sciences **65** (5) , 152101 (2022) https://doi.org/10.1007/s11432-020-2996-2

下载 PDF 在线阅读 收藏 引用 推荐

一、标题

➢ 常见问题

- 也有用on引出的介词短语的，表示“论（关于）……”之意；

一、标题

➢ 常见问题

- 标题中开头的冠词可以省略；

高品质封面图

第65卷 (2022)

第12期 (部分)

2022, 第65卷, 第8期

全选 取消选择 引用 下载 PDF

RESEARCH PAPER

Quantum algorithm and experimental demonstration for the subset sum problem

Qilin ZHENG, Pingyu ZHU, Shichuan XUE, Yang WANG, Chao WU, Xinyao YU, Miaomiao YU, Yingwen LIU, Mingtang DENG, Junjie WU, Ping XU

SCIENCE CHINA Information Sciences **65** (8) , 182501 (2022) https://doi.org/10.1007/s11432-021-3334-1

下载 PDF 在线阅读 收藏 引用 推荐

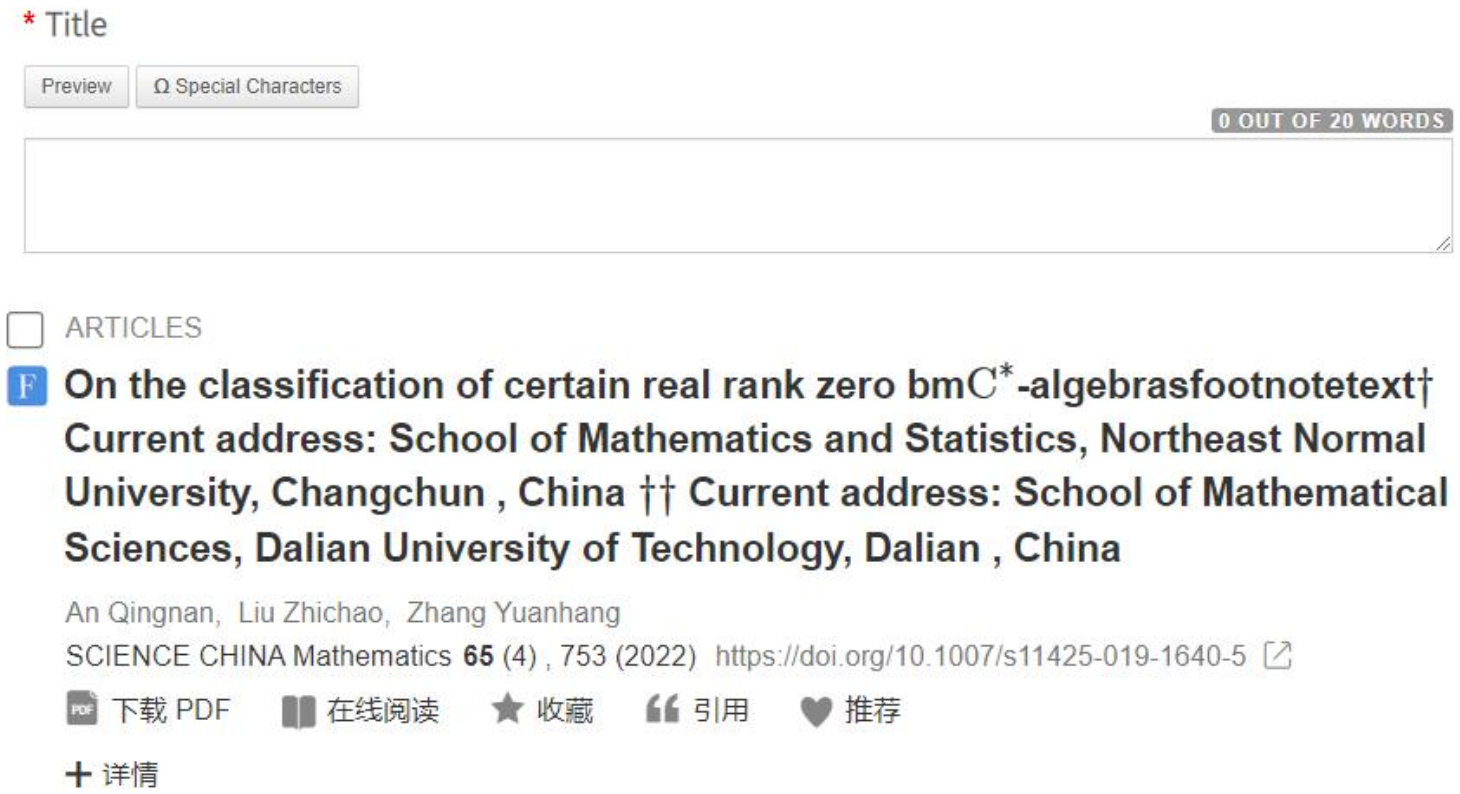
一、标题

➢ 常见问题

- 应该使用名词短语，不该使用一个句子或不定式短语；
- 一般也不用介词短语等形式；
- 标题中也不出现从句；
- 也有用on引出的介词短语的，表示“论（关于）……”之意；
- 标题中开头的冠词可以省略；

一、标题

➢ 常见问题


* Title
Preview
Ω Special Characters
0 OUT OF 20 WORDS
ARTICLES
On the classification of certain real rank zero bmC*-algebrasfootnotetext† Current address: School of Mathematics and Statistics, Northeast Normal University, Changchun , China †† Current address: School of Mathematical Sciences, Dalian University of Technology, Dalian , China
An Qingnan, Liu Zhichao, Zhang Yuanhang
SCIENCE CHINA Mathematics 65 (4) , 753 (2022) https://doi.org/10.1007/s11425-019-1640-5
下载 PDF
在线阅读
收藏
引用
推荐
详情

提纲

一 标题

二 作者

三 摘要

二、作者

➢ 作者名字

- 一定用全名

名 字 —first name, given name 或 forename

中间—middle name

姓 氏 —surname, family name 或 last name

- 中国人

根据中文惯例按汉语顺序用汉语拼音文字写出，如

He Kaiming, Kaiming He, Kai-ming

Deep residual learning for image recognition

K He, X Zhang, S Ren, J Sun - Proceedings of the IEEE ..
openaccess.thecvf.com

Deeper neural networks are more difficult to train. We pres
ease the training of networks that are substantially deeper

☆ 被引用次数：108529 相关文章 »

二、作者

➢ 作者名字

SCIENCE CHINA
Information Sciences

• RESEARCH PAPER •

December 2021, Vol. 64 222202:1–222202:15
https://doi.org/10.1007/s11432-020-3108-6

Nonlinear output-feedback tracking in multiagent systems with an unknown leader and directed communication

Xinghu WANG[1], Youfeng SU[2] & Dabo XU[3*]

[1]*Department of Automation, University of Science and Technology of China, Hefei* 230027, *China;*
[2]*College of Mathematics and Computer Science, Fuzhou University, Fuzhou* 350116, *China;*
[3]*School of Automation, Nanjing University of Science and Technology, Nanjing* 210094, *China*

二、作者

➢ 作者名字

Contents lists available at ScienceDirect

Automatica

journal homepage: www.elsevier.com/locate/automatica

Structural balance and interpersonal appraisals dynamics: Beyond all-to-all and two-faction networks☆

Wenjun Mei [a,d], Ge Chen [b,*], Noah E. Friedkin [c], Florian Dörfler [d]

[a] Department of Mechanics and Engineering Science, Peking University, Beijing, China
[b] Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China
[c] Department of Sociology, University of California, Santa Barbara, United States of America
[d] Automatic Control Laboratory, ETH Zurich, Switzerland

二、作者

➢ 会员名称

- IEEE--Institute of Electrical and Electronics Engineers(电气与电子工程师协会) [美]
- IRE--Institute of Radio Engineers(无线电工程师协会)[英]

- Student Member, IEEE
- Member, IEEE
- Senior Member, IEEE
- Fellow, IEEE
- Life Fellow, IEEE

二、作者

➢ 会员名称

7744 IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS, VOL. 69, NO. 8, AUGUST 2022

Design and Analysis of a Novel Permanent Magnet Homopolar Inductor Machine With Mechanical Flux Modulator for Flywheel Energy Storage System

Jiangtao Yang, *Member, IEEE*, Qing Li, *Student Member, IEEE*, Shoudao Huang, *Senior Member, IEEE*, Caiyong Ye, *Member, IEEE*, Ping Liu, *Senior Member, IEEE*, Bo Ma, and Lei Wang, *Senior Member, IEEE*

二、作者

➢ 会员名称

- IEEE--Institute of Electrical and Electronics Engineers(电气与电子工程师协会)[美]
- 例如

  Student Member, IEEE

  Member, IEEE

  Senior Member, IEEE

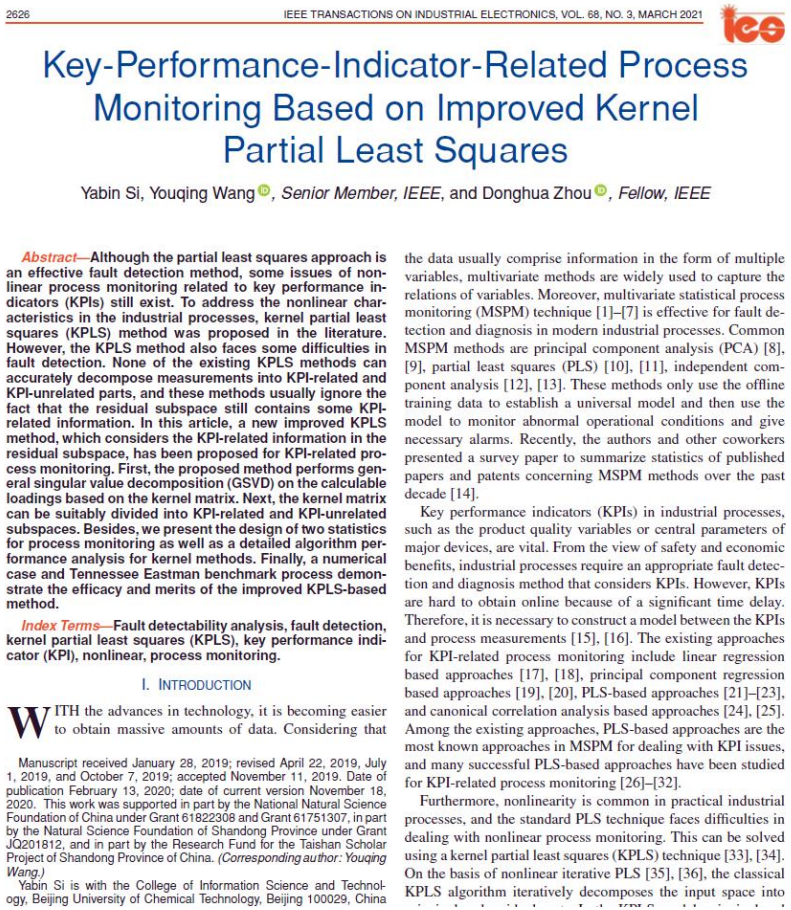
  Fellow, IEEE

  Life Fellow, IEEE

➢ 作者单位

- School of Mechatronic Engineering and Automation , Shanghai University, Shanghai 200444, China
- 有些杂志把工作单位直接标在作者姓名下面，也有不少杂志把工作单位写在论文第1页的脚注。

二、作者



Key-Performance-Indicator-Related Process Monitoring Based on Improved Kernel Partial Least Squares

Yabin Si, Youqing Wang, *Senior Member, IEEE*, and Donghua Zhou, *Fellow, IEEE*

***Abstract*—Although the partial least squares approach is an effective fault detection method, some issues of nonlinear process monitoring related to key performance indicators (KPIs) still exist. To address the nonlinear characteristics in the industrial processes, kernel partial least squares (KPLS) method was proposed in the literature. However, the KPLS method also faces some difficulties in fault detection. None of the existing KPLS methods can accurately decompose measurements into KPI-related and KPI-unrelated parts, and these methods usually ignore the fact that the residual subspace still contains some KPI-related information. In this article, a new improved KPLS method, which considers the KPI-related information in the residual subspace, has been proposed for KPI-related process monitoring. First, the proposed method performs general singular value decomposition (GSVD) on the calculable loadings based on the kernel matrix. Next, the kernel matrix can be suitably divided into KPI-related and KPI-unrelated subspaces. Besides, we present the design of two statistics for process monitoring as well as a detailed algorithm performance analysis for kernel methods. Finally, a numerical case and Tennessee Eastman benchmark process demonstrate the efficacy and merits of the improved KPLS-based method.**

***Index Terms*—Fault detectability analysis, fault detection, kernel partial least squares (KPLS), key performance indicator (KPI), nonlinear, process monitoring.**

I. Introduction

With the advances in technology, it is becoming easier to obtain massive amounts of data. Considering that the data usually comprise information in the form of multiple variables, multivariate methods are widely used to capture the relations of variables. Moreover, multivariate statistical process monitoring (MSPM) technique [1]–[7] is effective for fault detection and diagnosis in modern industrial processes. Common MSPM methods are principal component analysis (PCA) [8], [9], partial least squares (PLS) [10], [11], independent component analysis [12], [13]. These methods only use the offline training data to establish a universal model and then use the model to monitor abnormal operational conditions and give necessary alarms. Recently, the authors and other coworkers presented a survey paper to summarize statistics of published papers and patents concerning MSPM methods over the past decade [14].

Key performance indicators (KPIs) in industrial processes, such as the product quality variables or central parameters of major devices, are vital. From the view of safety and economic benefits, industrial processes require an appropriate fault detection and diagnosis method that considers KPIs. However, KPIs are hard to obtain online because of a significant time delay. Therefore, it is necessary to construct a model between the KPIs and process measurements [15], [16]. The existing approaches for KPI-related process monitoring include linear regression based approaches [17], [18], principal component regression based approaches [19], [20], PLS-based approaches [21]–[23], and canonical correlation analysis based approaches [24], [25]. Among the existing approaches, PLS-based approaches are the most known approaches in MSPM for dealing with KPI issues, and many successful PLS-based approaches have been studied for KPI-related process monitoring [26]–[32].

Furthermore, nonlinearity is common in practical industrial processes, and the standard PLS technique faces difficulties in dealing with nonlinear process monitoring. This can be solved using a kernel partial least squares (KPLS) technique [33], [34]. On the basis of nonlinear iterative PLS [35], [36], the classical KPLS algorithm iteratively decomposes the input space into

Manuscript received January 28, 2019; revised April 22, 2019, July 1, 2019, and October 7, 2019; accepted November 11, 2019. Date of publication February 13, 2020; date of current version November 18, 2020. This work was supported in part by the National Natural Science Foundation of China under Grant 61822308 and Grant 61751307, in part by the Natural Science Foundation of Shandong Province under Grant JQ201812, and in part by the Research Fund for the Taishan Scholar Project of Shandong Province of China. *(Corresponding author: Youqing Wang.)*

Yabin Si is with the College of Information Science and Technology, Beijing University of Chemical Technology, Beijing 100029, China (e-mail: siyabin@163.com).

Youqing Wang is with the Shandong University of Science and Technology, Qingdao 266590, China, and also with the Beijing University of Chemical Technology, Beijing 100029, China (e-mail: wang.youqing@ieee.org).

Donghua Zhou is with the Shandong University of Science and Technology, Qingdao 266590, China (e-mail: zdh@tsinghua.edu.cn).

Color versions of one or more of the figures in this article are available online at https://ieeexplore.ieee.org.

Digital Object Identifier 10.1109/TIE.2020.2972472

二、作者

Contents lists available at ScienceDirect

Automatica

journal homepage: www.elsevier.com/locate/automatica

Distributed adaptive Newton methods with global superlinear convergence☆

Jiaqi Zhang [a], Keyou You [a,*], Tamer Başar [b]

[a] Department of Automation, and BNRist, Tsinghua University, Beijing 100084, China
[b] Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL 61801, USA

ARTICLE INFO

Article history:
Received 13 April 2021
Received in revised form 2 October 2021
Accepted 30 November 2021

ABSTRACT

This paper considers the distributed optimization problem where each node of a peer-to-peer network minimizes a finite sum of objective functions by communicating with its neighboring nodes. In sharp contrast to the existing literature where the fastest distributed algorithms converge either with a global linear or a local superlinear rate, we propose a distributed adaptive Newton (DAN) algorithm

二、作者

➢ 常见问题


知乎
首页
会员
发现
等你来答
美国正式宣布对俄罗斯关闭领空
科研
学术
论文
为什么经常会出现导师和学生抢论文第一作者署名的情况?
按照我的理解，通讯作者才有更高的地位，因为他/她 需要对全文内容负责，而不只是自己参与的那一部分工作。署通讯作者，表明是此工作的指导者和决策者。
似乎国内这种情况尤其多，独立研究组也会出现，是在职称评审上有什么要求吗?
关注者
1,816
被浏览
1,925,015

二、作者

匿名用户

248 人赞同了该回答

查了一圈，觉得必须来说几句。

@笑道人 所说的情况，与我所熟悉的模式大相径庭。但是我仍然赞同他的答案，因为他完美地解释了为何会有导师和学生抢一作。通讯作者在国内地位如此之低，让我大跌眼镜。感谢@笑道人 让我知道这个信息。

根据我的经验，以及刚才我在网上的验证，国际通行做法是不一样的，更接近@金晨羽 和@孙尉翔 的描述。除了按字母排序的情况，**一篇文章的作者中，最有地位的是第一作者和通讯作者。**

第一作者无疑是干活的人，而通讯作者是决策的人，并且对文章负责，他的署名会有特殊标记。一般来说这个人就是导师。**通行做法是导师不管贡献有多大，只要不是一作，名字都放在最后。**所以这又叫 last author。

因此文章的署名，**最重要的是 first author 和 last author**。如果对文章内容有疑问，就找这两个人。

至于国内评职称把二作三作看得比通讯作者重，只能笑而不语了。

二、作者

瑾cici

旅行话题下的优秀答主

553 人赞同了该回答

还有一种偏门情况，有些**坑爹的实验室**论文作者排序按照 **姓！氏！字！母！序！**

许多欧洲lab都是这样，比如做理论的，比如做数据库的（我们lab ）。米国一些做理论的lab也是这样。

真不是我导师跟我抢。多年的习惯了。他姓Gottlob. 我姓Wang。所以按规矩我常年呆在倒数第一的老板专座，别人给我写信经常直接 Professor Wang, 甚至有个人跟我写信问 Professor Wang 是不是可以跟Dr. Gottlob说一下给他发一份测试数据什么的。 （好逆天的一封信）

或许只有毕业前嫁个姓什么Alexander的比较有效。可能嫁个Abington 或者 Aaron 更保险-_-

二、作者

匿名用户

2,620 人赞同了该回答

你以为我想要抢学生的一作吗？你以为我不知道抢学生的一作很丢脸吗？

当初自己在国外读博的时候，哪怕导师贡献的60%都是我一作老板二作。我现在做博导，我一作学生二作我都觉得没脸见自己老师好吗？

但是为什么呢？学校的考评、基金的申请就要看你有多少一作文章。你如果不是一作，他们就要challenge你，说我们无法了解你在这篇文章里面做了多少贡献，也就无法衡量你的水平。然后学校评价学生的时候呢：如果导师一作学生二作，毕业时等同于学生一作处理。所以就是这一整套评价体系逼着我这么干的。

当然，我也是要脸的人。我的姓氏字典序相对靠前。所以目前只能一律字典序，然后文章加注『parallel authorship, equal contribution』了事。这样学生也算并列一作，我也勉强能够有脸见自己当年的导师吧。

二、作者

➢ 常见问题

- 作者？
- 第一作者？
- 通讯作者？
- 共同第一作者？
- 共同通讯作者？
- 同等贡献作者？

二、作者

➢ （可能是）史上作者最多的论文

Physics Letters B 688 (2010) 21–42

Contents lists available at ScienceDirect

Physics Letters B

www.elsevier.com/locate/physletb

Charged-particle multiplicities in pp interactions at $\sqrt{s} = 900$ GeV measured with the ATLAS detector at the LHC ☆,☆☆

ATLAS Collaboration

ATLAS Collaboration

G. Aad [48], E. Abat [18a,*], B. Abbott [110], J. Abdallah [11], A.A. Abdelalim [49], A. Abdesselam [117], O. Abdinov [10], B. Abi [111], M. Abolins [88], H. Abramowicz [151], H. Abreu [114], E. Acerbi [89a,89b], B.S. Acharya [162a,162b], M. Ackers [20], D.L. Adams [24], T.N. Addy [56], J. Adelman [173], M. Aderholz [99], C. Adorisio [36a,36b], P. Adragna [75], T. Adye [128], S. Aefsky [22], J.A. Aguilar-Saavedra [123b], M. Aharrouche [81], S.P. Ahlen [21], F. Ahles [48], A. Ahmad [146], H. Ahmed [2], M. Ahsan [40], G. Aielli [132a,132b], T. Akdogan [18a], P.F. Åkesson [29], T.P.A. Åkesson [79], G. Akimoto [153], A.V. Akimov [94], A. Aktas [48], M.S. Alam [1], M.A. Alam [76], J. Albert [167], S. Albrand [55], M. Aleksa [29], I.N. Aleksandrov [65], M. Aleppo [89a,89b], F. Alessandria [89a], C. Alexa [25a], G. Alexander [151], G. Alexandre [49], T. Alexopoulos [9], M. Alhroob [20], M. Aliev [15], G. Alimonti [89a], J. Alison [119], M. Aliyev [10], P.P. Allport [73], S.E. Allwood-Spiers [53], J. Almond [82], A. Aloisio [102a,102b], R. Alon [169], A. Alonso [79], J. Alonso [14], M.G. Alviggi [102a,102b], K. Amako [66], P. Amaral [29], G. Ambrosini [16], G. Ambrosio [89a,a], C. Amelung [22], V.V. Ammosov [127,*], A. Amorim [123a], G. Amorós [165], N. Amram [151], C. Anastopoulos [138], T. Andeen [29], C.F. Anders [48], K.J. Anderson [30], A. Andreazza [89a,89b], V. Andrei [58a], M.-L. Andrieux [55], X.S. Anduaga [70], A. Angerami [34], F. Anghinolfi [29], N. Anjos [123a], A. Annovi [47], A. Antonaki [8], M. Antonelli [47], S. Antonelli [19a,19b], J. Antos [143b], B. Antunovic [41], F. Anulli [131a], S. Aoun [83], G. Arabidze [8], I. Aracena [142], Y. Arai [66], A.T.H. Arce [14], J.P. Archambault [28], S. Arfaoui [29,b], J.-F. Arguin [14], T. Argyropoulos [9], E. Arik [18a,*], M. Arik [18a], A.J. Armbruster [87], K.E. Arms [108], S.R. Armstrong [24], O. Arnaez [4], C. Arnault [114], A. Artamonov [95], D. Arutinov [20], M. Asai [142], S. Asai [153], R. Asfandiyarov [170], S. Ask [82], B. Åsman [144a,144b], D. Asner [28], L. Asquith [77], K. Assamagan [24], A. Astbury [167], A. Astvatsatourov [52], B. Athar [1], G. Atoian [173], B. Aubert [4], B. Auerbach [173], E. Auge [114], K. Augsten [126], M. Aurousseau [4], N. Austin [73], G. Avolio [161], R. Avramidou [9], D. Axen [166], C. Ay [54], G. Azuelos [93,c], Y. Azuma [153], M.A. Baak [29], G. Baccaglioni [89a], C. Bacci [133a,133b], A.M. Bach [14], H. Bachacou [135], K. Bachas [29], G. Bachy [29], M. Backes [49], E. Badescu [25a], P. Bagnaia [131a,131b], Y. Bai [32a], D.C. Bailey [156], T. Bain [156], J.T. Baines [128], O.K. Baker [173], M.D. Baker [24], S. Baker [77], F. Baltasar Dos Santos Pedrosa [29], E. Banas [38], P. Banerjee [93], S. Banerjee [167], D. Banfi [89a,89b], A. Bangert [136], V. Bansal [167], S.P. Baranov [94], S. Baranov [65], A. Barashkou [65], T. Barber [27], E.L. Barberio [86], D. Barberis [50a,50b], M. Barbero [20], D.Y. Bardin [65], T. Barillari [99], M. Barisonzi [172], T. Barklow [142], N. Barlow [27], B.M. Barnett [128], R.M. Barnett [14], A. Baroncelli [133a], M. Barone [47], A.J. Barr [117], F. Barreiro [80], J. Barreiro Guimarães da Costa [57], P. Barrillon [114], V. Bartheld [99], H. Bartko [99], R. Bartoldus [142], D. Bartsch [20], R.L. Bates [53], S. Bathe [24], L. Batkova [143a], J.R. Batley [27], A. Battaglia [16], M. Battistin [29],

提纲

一 标题

二 作者

三 摘要

三、摘要

- Abstract--A miniversion of the paper

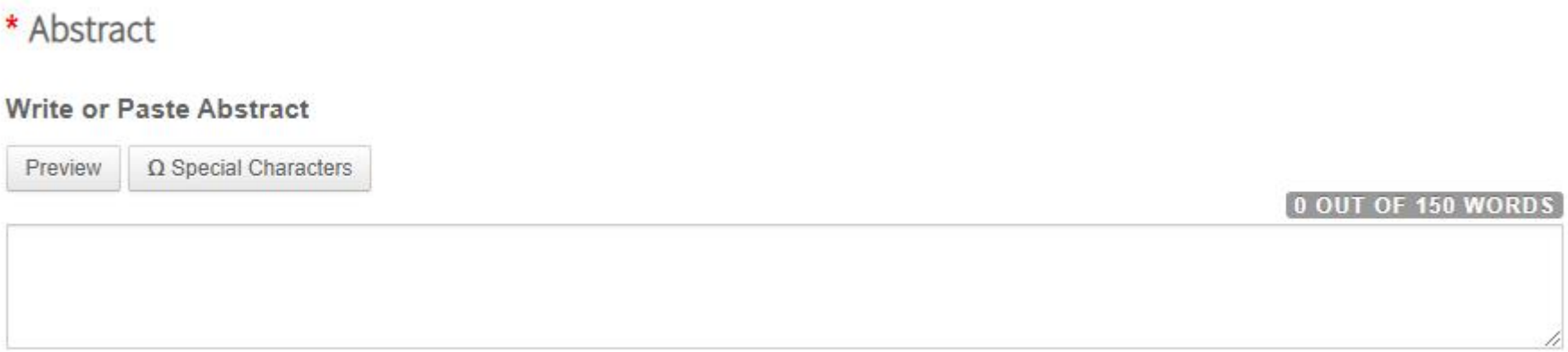
Deep learning and process understanding for data-driven Earth system science

Markus Reichstein[1,2*], Gustau Camps-Valls[3], Bjorn Stevens[4], Martin Jung[1], Joachim Denzler[2,5], Nuno Carvalhais[1,6] & Prabhat[7]

Machine learning approaches are increasingly used to extract patterns and insights from the ever-increasing stream of geospatial data, but current approaches may not be optimal when system behaviour is dominated by spatial or temporal context. Here, rather than amending classical machine learning, we argue that these contextual cues should be used as part of deep learning (an approach that is able to extract spatio-temporal features automatically) to gain further process understanding of Earth system science problems, improving the predictive ability of seasonal forecasting and modelling of long-range spatial connections across multiple timescales, for example. The next step will be a hybrid modelling approach, coupling physical process models with the versatility of data-driven machine learning.

三、摘要

- Abstract--A miniversion of the paper
  - 论文内容的概括性说明，数十或数百字不等；



三、摘要

- Abstract--A miniversion of the paper

  - 论文内容的概括性说明，数十或数百字不等；
  - 主要内容：

    研究的目的与意义

    研究的方法与途径

    研究的成果与结论

In this paper, we propose a novel PM framework using spatiotemporal PCA, where the spatial prior is incorporated to preserve the cause-effect relationship of process variables, and the temporal prior is embedded to maintain the geometric structure of process samples. Moreover, a sparse regularization term is introduced to filter out noise, thereby improving the monitoring performance. In algorithms, an efficient and convergent optimization scheme is developed using the alternating direction method of multipliers (ADMM) in a symmetric Gauss-Seidel (sGS) manner. Finally, the improved monitoring performance is verified on the benchmark Tennessee Eastman (TE) process.

三、摘要

How to construct a *Nature* summary paragraph

Annotated example taken from *Nature* **435,** 114–118 (5 May 2005).

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines.

One sentence clearly stating the **general problem** being addressed by this particular study.

One sentence summarizing the main result (with the words "**here we show**" or their equivalent).

Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

One or two sentences to put the results into a more **general context**.

Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline, may be included in the first paragraph if the editor considers that the accessibility of the paper is significantly enhanced by their inclusion. Under these circumstances, the length of the paragraph can be up to 300 words. (This example is 190 words without the final section, and 250 words with it).

During cell division, mitotic spindles are assembled by microtubule-based motor proteins[1,2]. The bipolar organization of spindles is essential for proper segregation of chromosomes, and requires plus-end-directed homotetrameric motor proteins of the widely conserved kinesin-5 (BimC) family[3]. Hypotheses for bipolar spindle formation include the 'push–pull mitotic muscle' model, in which kinesin-5 and opposing motor proteins act between overlapping microtubules[2,4,5]. However, the precise roles of kinesin-5 during this process are unknown. Here we show that the vertebrate kinesin-5 Eg5 drives the sliding of microtubules depending on their relative orientation. We found in controlled *in vitro* assays that Eg5 has the remarkable capability of simultaneously moving at ~20 nm s^{-1} towards the plus-ends of each of the two microtubules it crosslinks. For anti-parallel microtubules, this results in relative sliding at ~40 nm s^{-1}, comparable to spindle pole separation rates *in vivo*[6]. Furthermore, we found that Eg5 can tether microtubule plus-ends, suggesting an additional microtubule-binding mode for Eg5. Our results demonstrate how members of the kinesin-5 family are likely to function in mitosis, pushing apart interpolar microtubules as well as recruiting microtubules into bundles that are subsequently polarized by relative sliding. We anticipate our assay to be a starting point for more sophisticated *in vitro* models of mitotic spindles. For example, the individual and combined action of multiple mitotic motors could be tested, including minus-end-directed motors opposing Eg5 motility. Furthermore, Eg5 inhibition is a major target of anti-cancer drug development, and a well-defined and quantitative assay for motor function will be relevant for such developments.

三、摘要

➢ 那些奇葩的摘要

IOP PUBLISHING JOURNAL OF PHYSICS A: MATHEMATICAL AND THEORETICAL
J. Phys. A: Math. Theor. 44 (2011) 492001 (5pp) doi:10.1088/1751-8113/44/49/492001

FAST TRACK COMMUNICATION

Can apparent superluminal neutrino speeds be explained as a quantum weak measurement?

M V Berry[1], N Brunner[1], S Popescu[1] and P Shukla[2]

[1] H H Wills Physics Laboratory, Tyndall Avenue, Bristol BS8 1TL, UK
[2] Department of Physics, Indian Institute of Technology, Kharagpur, India

Received 12 October 2011, in final form 27 October 2011
Published 11 November 2011
Online at stacks.iop.org/JPhysA/44/492001

Abstract
Probably not.

PACS numbers: 03.65.Ta, 03.65.Xp, 14.60.Pq

IEEE TRANSACTIONS ON AUTOMATIC CONTROL, VOL. AC-23, NO. 4, AUGUST 1978

Guaranteed Margins for LQG Regulators

JOHN C. DOYLE

Abstract—There are none.

Bulletin of the
Seismological Society of America

Vol. 64 October 1974 No. 5

IS THE SEQUENCE OF EARTHQUAKES IN SOUTHERN CALIFORNIA, WITH AFTERSHOCKS REMOVED, POISSONIAN?

By J. K. Gardner and L. Knopoff

ABSTRACT

Yes.

三、摘要

➢ 写作要点

- 完整性：有相对独立的结构，保证摘要的完整性和独立可读性；

Abstract—Sparse regression based feature selection method has been extensively investigated these years. However, because it has a non-convex constraint, i.e., $\ell_{2,0}$-norm constraint, this problem is very hard to solve. In this paper, unlike most of the other methods which only solve its slack version by introducing sparsity regularization into objective function forcibly, a novel framework is proposed by us to solve the original $\ell_{2,0}$-norm constrained sparse regression based feature selection problem. We transform our objective function into Linear Discriminant Analysis (LDA) by using a new label coding method, thus enabling our model to calculate the ratio of inter-class scatter to intra-class scatter of features which is the most widely used feature discrimination evaluation metric. According to that ratio, features can be selected by a simple sorting method. The projection gradient descent algorithm is introduced to further improve the performance of our algorithm by using the solution obtained before as its initial solution. This ensures the stability of this iterative algorithm. We prove that the proposed method can get the global optimal solution of this non-convex problem when all features are statistically independent. For the general case where features are statistically dependent, extensive experiments on six small sample size datasets and one large-scale dataset show that our algorithm has comparable or better classification capability comparing with other eight state-of-the-art feature selection methods by the SVM classifier. We also show that our algorithm can obtain a low loss value, which means the solution of our algorithm can get very close to this NP-hard problem's real solution. What is more, because we solve the original $\ell_{2,0}$-norm constrained problem, we avoid the heavy work of tuning the regularization parameter because its meaning is explicit in our method, i.e., the number of selected features. At last, we evaluate the stability of our algorithm from two perspectives, i.e., the objective function values and the selected features, by experiments. From both perspectives, our algorithm shows satisfactory stability performance.

三、摘要

➢ 写作要点

- 简洁性：开门见山，烦言休叙；

***Abstract*—In this paper, a new data-driven fault detection method based on distributed canonical correlation analysis (D-CCA) is proposed to address the plant-wide process monitoring problem. This paper focuses on the distributed plant-wide processes. The core of the proposed method is to reduce uncertainties using correlation information from the neighboring nodes. Furthermore, the cost of the data transmission between network nodes is also reduced by the D-CCA algorithm. When the proposed method and the existing methods are compared using the Tennessee Eastman benchmark process, the false alarm rate, fault detection rate, and the detection delay are comparable. This suggests that the proposed method is feasible.**

三、摘要

➢ 写作要点

- 创新性：列出文章的novelty和contribution；

ABSTRACT

Projection to latent structures or partial least squares (PLS) produces output-supervised decomposition on input **X**, while principal component analysis (PCA) produces unsupervised decomposition of input **X**. In this paper, the effect of output **Y** on the **X**-space decomposition in PLS is analyzed and geometric properties of the PLS structure are revealed. Several PLS algorithms are compared in a geometric way for the purpose of process monitoring. A numerical example and a case study are given to illustrate the analysis results.

三、摘要

➢ 写作要点

- 完整性：有相对独立的结构，保证摘要的完整性和独立可读性；
- 简洁性：开门见山，烦言休叙；
- 创新性：列出文章的novelty和contribution。

三、摘要

➢ 注意事项

- 时态常用一般现在时，并注意时态的一致性；

ABSTRACT

Projection to latent structures or partial least squares (PLS) produces output-supervised decomposition on input **X**, while principal component analysis (PCA) produces unsupervised decomposition of input **X**. In this paper, the effect of output **Y** on the **X**-space decomposition in PLS is analyzed and geometric properties of the PLS structure are revealed. Several PLS algorithms are compared in a geometric way for the purpose of process monitoring. A numerical example and a case study are given to illustrate the analysis results.

三、摘要

➢ 注意事项

- 避免在摘要中重复标题文字；

A Distributed Canonical Correlation Analysis-Based Fault Detection Method for Plant-Wide Process Monitoring

Zhiwen Chen, *Member, IEEE*, Yue Cao, *Student Member, IEEE*, Steven X. Ding, Kai Zhang, Tim Koenings, Tao Peng, Chunhua Yang, and Weihua Gui

***Abstract*—In this paper, a new data-driven fault detection method based on distributed canonical correlation analysis (D-CCA) is proposed to address the plant-wide process monitoring problem. This paper focuses on the distributed plant-wide processes. The core of the proposed method is**

NOMENCLATURE

$\mathcal{K}$	Set of the number of subprocesses/nodes.
$\mathcal{K}\backslash\{q\}$	Subset of $\mathcal{K}$ excluding the node q.

三、摘要

➢ 注意事项

- 摘要中也不用图表、方程、结构式等非文字性内容；

Learning from Very Few Samples: A Survey

Jiang Lu, Pinghua Gong, Jieping Ye, *Fellow, IEEE*, Jianwei Zhang, *Member, IEEE*,
and Changshui Zhang, *Fellow, IEEE*

Abstract—Few sample learning (FSL) is significant and challenging in the field of machine learning. The capability of learning and generalizing from very few samples successfully is a noticeable demarcation separating artificial intelligence and human intelligence since humans can readily establish their cognition to novelty from just a single or a handful of examples whereas machine learning algorithms typically entail hundreds or thousands of supervised samples to guarantee generalization ability. Despite the long history dated back to the early 2000s and the widespread attention in recent years with booming deep learning technologies, little surveys or reviews for FSL are available until now. In this context, we extensively review 300+ papers of FSL spanning from the 2000s to 2019 and provide a timely and comprehensive survey for FSL. In this survey, we review the evolution history as well as the current progress on FSL, categorize FSL approaches into the generative model based and discriminative model based kinds in principle, and emphasize particularly on the meta learning based FSL approaches. We also summarize several recently emerging extensional topics of FSL and review the latest advances on these topics. Furthermore, we highlight the important FSL applications covering many research hotspots in computer vision, natural language processing, audio and speech, reinforcement learning and robotic, data analysis, etc. Finally, we conclude the survey with a discussion on promising trends in the hope of providing guidance and insights to follow-up researches.

三、摘要

➢ 注意事项

- 时态常用一般现在时，并注意时态的一致性；
- 避免在摘要中重复标题文字；
- 摘要中也不用图表、方程、结构式等非文字性内容。

三、摘要

➢ An Example of Abstract

Abstract—Cyber-physical systems are ubiquitous in power systems, transportation networks, industrial control processes, and critical infrastructures. These systems need to operate reliably in the face of unforeseen failures and external malicious attacks. In this paper: i) we propose a mathematical framework for cyber-physical systems, attacks, and monitors; ii) we characterize fundamental monitoring limitations from system-theoretic and graph-theoretic perspectives; and ii) we design centralized and distributed attack detection and identification monitors. Finally, we validate our findings through compelling examples.

三、摘要

➢ An Example of Abstract

Abstract—Cyber-physical systems are ubiquitous in power systems, transportation networks, industrial control processes, and critical infrastructures. These systems need to operate reliably in the face of unforeseen failures and external malicious attacks. In this paper: i) we propose a mathematical framework for cyber-physical systems, attacks, and monitors; ii) we characterize fundamental monitoring limitations from system-theoretic and graph-theoretic perspectives; and ii) we design centralized and distributed attack detection and identification monitors. Finally, we validate our findings through compelling examples.

➢ 摘要语言特点

- 谓语动词很简单而句子的其余成分却十分复杂；
- 大量使用be(主要用来陈述定义或表示“什么是什么”的陈述句)和have(主要用来叙述事物具有某种或某些特征时用)的变化形式做谓语动词；
- 使用不涉及人的陈述句；

三、摘要

➢ Typical Sentences

- This paper focuses on …
- This paper discusses …
- In this paper, … is presented/studied/investigated.
- This paper is concerned with …
- The purpose/objective of this paper is to …
- It is the aim of this paper to discuss/describe …

三、摘要

➢ Typical Sentences

- In this paper, we introduce/present/consider …
- The approach is based on …
- Conditions are considered for …
- The result of this study can be generalized for …
- The result for … are found to be close to the experimental data.

三、摘要

➢ Typical Words

- 回顾研究背景，常用的词有：review，summarize，present，outline，describe 等；
- 阐述写作或研究目的，常用的词有：purpose，attempt，aim 等，也可以用动词不定式充当目的状语；
- 介绍论文的重点内容或研究范围，常用的词有：study，present，include，focus，emphasize，emphasis，attention等；
- 介绍研究或实验过程，常用的词有：test，study，investigate，examine，experiment，discuss，consider，analyze，analysis 等；
- 说明研究或实验方法，常用的词有：measure，estimate，calculate 等；

三、摘要

➢ Typical Words

- 介绍应用、用途，常用的词有：use，apply，application等；
- 展示研究结果，常用的词有：show，result，present等；
- 介绍结论，常用的词有：summary，introduce，conclude等；
- 陈述论文的论点和作者的观点，常用的词有：suggest，report，present，explain，expect，describe等；
- 阐明论证，常用的词有：support，provide，indicate，identify，find，demonstrate，confirm，clarify等；
- 推荐或建议，常用的词有：suggest，suggestion，recommend，recommendation，propose，necessity，necessary，expect等；

三、摘要

➢ 关键词

- key words或key terms(关键词)或index terms(索引词)或subject terms(主题词);
- 关键词一般是名词性的词或词组，个别情况下也有动词性的词或词组，目的是为了提供检索服务;
- 3～8个关键词;
- 排序?

Abstract—Cyber-physical systems are ubiquitous in power systems, transportation networks, industrial control processes, and critical infrastructures. These systems need to operate reliably in the face of unforeseen failures and external malicious attacks. In this paper: i) we propose a mathematical framework for cyber-physical systems, attacks, and monitors; ii) we characterize fundamental monitoring limitations from system-theoretic and graph-theoretic perspectives; and ii) we design centralized and distributed attack detection and identification monitors. Finally, we validate our findings through compelling examples.

Index Terms—Cyber-physical systems, descriptor systems, distributed control, fault detection, geometric control, graph theory, networks, security.

三、摘要

Distributed adaptive convergence☆

Jiaqi Zhang [a], Keyou You [a,*],

[a] Department of Automation, and BNRist, Tsi
[b] Coordinated Science Laboratory, University

ARTICLE INFO

Article history:
Received 13 April 2021
Received in revised form 2 October 2021
Accepted 30 November 2021
Available online 25 January 2022

Keywords:
Distributed optimization
Newton method
Low-rank approximation
Superlinear convergence

A Distributed Can Analysis-Based Fau for Plant-Wide Pr

Zhiwen Chen, *Member, IEEE*, Yue Cao, Kai Zhang, Tim Koenings, Tao Peng

***Abstract*—In this paper, a new data-driven fault detection method based on distributed canonical correlation analysis (D-CCA) is proposed to address the plant-wide process monitoring problem. This paper focuses on the distributed plant-wide processes. The core of the proposed method is to reduce uncertainties using correlation information from the neighboring nodes. Furthermore, the cost of the data transmission between network nodes is also reduced by the D-CCA algorithm. When the proposed method and the existing methods are compared using the Tennessee Eastman benchmark process, the false alarm rate, fault detection rate, and the detection delay are comparable. This suggests that the proposed method is feasible.**

***Index Terms*—Data driven, distributed canonical correlation analysis, fault detection, plant-wide process monitoring.**

Superpixel-Guided Dis Representation of H for Class

Shujun Yang, *Member, IEEE*, Junhui Hou, *Seni*
Shaohui Mei, *Senior Member, IE*

***Abstract*—In this paper, we propose a novel classification scheme for the remotely sensed hyperspectral image (HSI), namely SP-DLRR, by comprehensively exploring its unique characteristics, including the local spatial information and low-rankness. SP-DLRR is mainly composed of two modules, i.e., the classification-guided superpixel segmentation and the discriminative low-rank representation, which are iteratively conducted. Specifically, by utilizing the local spatial information and incorporating the predictions from a typical classifier, the first module segments pixels of an input HSI (or its restoration generated by the second module) into superpixels. According to the resulting superpixels, the pixels of the input HSI are then grouped into clusters and fed into our novel discriminative low-rank representation model with an effective numerical solution. Such a model is capable of increasing the intra-class similarity by suppressing the spectral variations locally while promoting the inter-class discriminability globally, leading to a restored HSI with more discriminative pixels. Experimental results on three benchmark datasets demonstrate the significant superiority of SP-DLRR over state-of-the-art methods, especially for the case with an extremely limited number of training pixels.**

***Index Terms*—Low-rank, superpixel segmentation, hyperspectral image, classification.**

三、摘要

➢ 例子

A Review on Recent Development of Spacecraft Attitude Fault Tolerant Control System

Shen Yin, *Senior Member, IEEE*, Bing Xiao, Steven X. Ding, and Donghua Zhou, *Senior Member, IEEE*

***Abstract*—Motivated by several accidents, attitude control of a spacecraft subject to faults/failures has gained considerable attention in a wider range of aerospace engineering and academic communities. This paper is concerned with industrial practices and theoretical approaches for fault tolerant control (FTC) and fault detection and diagnosis (FDD) in spacecraft attitude control system. An overview on recent development of spacecraft attitude FTC system design is presented. The basis of a FTC system is introduced. The existing engineering FTC techniques and theoretical methodologies, including their advantages and disadvantages, are discussed. Moreover, closely associated with the reliability-relevant issues, recent progress in attitude FTC design strategies is reviewed. A brief review of some open problems in the general area of spacecraft attitude control design subject to components faults/failures is further concluded.**

***Index Terms*—Attitude control system, fault detection and diagnosis (FDD), fault-tolerant control (FTC), spacecraft.**

and controllers. Once a spacecraft is launched, it is highly unlikely that its hardware can be repaired. Hence, any component or system fault/failure cannot be fixed with replacement parts. These issues can potentially cause a host of economic, environmental, and safety problems. This strongly motivates the development of attitude control systems that ensure an efficient and timely response to maintain stability, reliability, and required performance properties even when components fail. In the aerospace industry and academia, fault tolerant control (FTC) [1]–[3] is a widely used technique to accommodate or manage component failures.

In contrast to most conventional control systems that the controllers are designed for fault-free case without considering the possibility of fault occurrence, the main characteristics of systems designed by FTC is that it can guarantee desirable stability and performance properties even in the event of component fault/failure. This is quite important for safety-critical systems,

三、摘要

➢ 例子

Mastering the game of Go without human knowledge

David Silver[1]*, Julian Schrittwieser[1]*, Karen Simonyan[1]*, Ioannis Antonoglou[1], Aja Huang[1], Arthur Guez[1], Thomas Hubert[1], Lucas Baker[1], Matthew Lai[1], Adrian Bolton[1], Yutian Chen[1], Timothy Lillicrap[1], Fan Hui[1], Laurent Sifre[1], George van den Driessche[1], Thore Graepel[1] & Demis Hassabis[1]

A long-standing goal of artificial intelligence is an algorithm that learns, *tabula rasa*, superhuman proficiency in challenging domains. Recently, AlphaGo became the first program to defeat a world champion in the game of Go. The tree search in AlphaGo evaluated positions and selected moves using deep neural networks. These neural networks were trained by supervised learning from human expert moves, and by reinforcement learning from self-play. Here we introduce an algorithm based solely on reinforcement learning, without human data, guidance or domain knowledge beyond game rules. AlphaGo becomes its own teacher: a neural network is trained to predict AlphaGo's own move selections and also the winner of AlphaGo's games. This neural network improves the strength of the tree search, resulting in higher quality move selection and stronger self-play in the next iteration. Starting *tabula rasa*, our new program AlphaGo Zero achieved superhuman performance, winning 100–0 against the previously published, champion-defeating AlphaGo.

如何在顶尖期刊上发表论文?

衣阿华州立大学　Kwan Choi*

本文为当今的学术论文作者提供了一些有用的建议。其目标是“普惠极善”。① 如果你觉得本文有用，请将它推荐给你的朋友们。如果你愿意遵循本文的大多数原则和建议，评上职称或者得到提升的概率就有可能大大增加。如果大多数作者掌握了本文介绍的基本技能，那么他们相互之间竞争的就是思想的真、善、美，而不是技巧的华丽包装。

免责声明：请注意，本文的建议并不一定会提高你的研究论文被采用发表的几率。当你下载或者复制本文时就意味着你同意：当你因采用本文中所提到的建议和原则而产生了间接的、意外的、相关的、失误性的、衍生的、或其他特殊的伤害或损失，本文作者概不负责。

提纲

四 引言

四、引言

Data-Driven Batch-End Quality Modeling and Monitoring Based on Optimized Sparse Partial Least Squares

Qingchao Jiang, *Member, IEEE*, Xuefeng Yan, Hui Yi, and Furong Gao

***Abstract*—Batch-end quality modeling is used to predict the quality by using batch measurements and generally involves a large number of predictor variables. However, not all of the variables are beneficial for the prediction. Conventional multiway partial least squares (PLS) may not function properly for batch-end quality modeling because of many irrelevant predictor variables. This paper proposes an optimized sparse PLS (OSPLS) modeling approach for simultaneous batch-end quality prediction and relevant-variable selection. The effect of irrelevant variables on the quality-prediction performance is analyzed, and the importance of the relevant-variable selection is emphasized. Then, an OSPLS batch-end quality modeling approach is developed by incorporating the variable resolution optimization and sparse PLS modeling. The quality-prediction accuracy and modeling interpretability are improved because only quality-relevant variables are selected, and quality-irrelevant variables are eliminated. Based on the selected quality-relevant variables, a statistic is established for monitoring the quality status. The proposed OSPLS-based modeling and monitoring approach is applied on a fed-batch penicillin fermentation process and an industrial injection molding process. The results are compared with the state-of-the-art methods to verify the effectiveness of the OSPLS approach.**

***Index Terms*—Batch-end quality prediction, batch processes, optimized sparse partial least square (OSPLS), soft sensing, sparse modeling.**

Manuscript received November 4, 2018; revised February 11, 2019, March 15, 2019, and April 26, 2019; accepted June 5, 2019. Date of publication June 19, 2019; date of current version January 3, 2020. This work was supported in part by the National Natural Science Foundation of China under Grant 61603138 and Grant 21878081, in part by the Shanghai Pujiang Program under Grant 17PJD009, in part by the Hong Kong Research Grant Council Project under Grant 16207717, and in part by the Programme of Introducing Talents of Discipline to Universities (the 111 Project) under Grant B17017. *(Corresponding author: Xuefeng Yan.)*

Q. Jiang and X. Yan are with the Key Laboratory of Advanced Control and Optimization for Chemical Processes of Ministry of Education, East China University of Science and Technology, Shanghai 200237, China (e-mail: qchjiang@ecust.edu.cn; xfyan@ecust.edu.cn).

H. Yi is with the College of Electronic Engineering and Control Science, Nanjing University of Technology, Nanjing 211816, China (e-mail: jsyihui@126.com).

F. Gao is with the Department of Chemical and Biomolecular Engineering, The Hong Kong University of Science and Technology, Hong Kong (e-mail: kefgao@ust.hk).

Color versions of one or more of the figures in this paper are available online at http://ieeexplore.ieee.org.

Digital Object Identifier 10.1109/TIE.2019.2922941

I. Introduction

LARGE portions of value-added products are produced in chemical and pharmaceutical industries by batch processes. Generally, a batch process consists of several phases, and the variables in a batch run are expected to follow a predefined recipe. Due to the variations in environmental conditions, reaction depths, or raw materials, the variable evolution recipe may be deviated, and the final product quality may be unsatisfactory. Thus, timely assessment of the process state and estimation of the final product quality is important [1], [2]. However, the quality variable is generally obtained with some delay because of the technique used or economic limitation. Establishing a soft-sensor model for quality prediction is important. Quality modeling and monitoring techniques are typically classified into two types, namely, mechanism (white-box) models and data-driven (black-box) models [3]–[7]. On the one hand, establishing a mathematic model is difficult because the reaction during a process is generally complex. On the other hand, abundant of history data are stored with the rapid advancement of sensing techniques. Data-driven modeling and monitoring techniques are gaining increasing attention [8]–[13].

Least square (LS) is the basic linear regression method for quality or key-performance-indicator modeling [14]. However, the LS generally fails in dealing with high-dimensional and highly correlated data, because of the regression coefficient stability and computational efficiency problems. To handle high-dimensional and highly correlated data, partial least squares (PLS) is proposed and among the most popular data-driven soft-sensor development methods [15]. For batch processes, the multiway PLS (MPLS) that unfolds the three-way data as two-way data is generally used [16]. However, the following defects of classical MPLS method exist, which may degrade the prediction performance. After data unfolding, the number of predictor variables can be remarkably large, whereas the number of predictor measurements is generally small. For example, in a batch process that has ten variables and 200 measurements in each batch and a set of data with 100 batches, the number of predictor variables is $10 \times 200 = 2000$ while the number of predictor measurements is 100. The number of samples n is much smaller than the number of variables m, this refers to the large m small n problem. Not all predictor variables are beneficial for predicting the final quality; the existence of irrelevant variables may damage useful information and degrade prediction

performance. Therefore, it is important to select the relevant variables and eliminate the irrelevant variables in PLS-based modeling.

In PLS-based soft-sensor development, several variable-selection methods are developed, which are categorized into three categories, namely, filter methods, wrapper methods, and embedded methods [17]–[19]. In filter methods, a PLS regression (PLSR) model is first established on the data, then variable selection is performed according to certain rules in evaluating the variable importance. Wrapper methods are computationally expensive because they generally involve double-iterative procedures. The embedded methods perform the selection of variables using a one-iterative procedure, therefore are generally less time consuming than wrapper methods. However, these methods may not function effectively in batch-end quality prediction because of the process complexity and the large m small n problem.

In dealing with the large m small n problem in batch-end quality prediction, representative techniques include the sparse PLS (SPLS) [20] and the multiresolution PLS (MRPLS) [21]. SPLS performs simultaneous regression and selects variables by adding the L_1 penalty term to the optimization objective function of PLS. SPLS produces sparse linear combinations of predictor variables and makes a subtle variable selection. However, the prediction performance will also degrade as the number of quality-irrelevant variable increases. MRPLS performs variable selection by considering the variable time resolution or the time periods. Facco *et al.* highlighted that the quality prediction of PLS can be improved by including time series dynamic information into the modeling. A moving average three-phase PLS estimator was developed for a real-world industrial batch polymerization process [22]. Gins *et al.* discussed the effect of time resolution selection on the prediction performance and proposed a multiresolution quality prediction (MRQP) method [23]. The improved performance is obtained when the structured correlation in time and variable dimensions is considered. More recently, Rato and Reis further extended the MRQP method and proposed an MRPLS modeling method for batch data analysis [21]. The optimal-variable selection is conducted in three dimensions, namely, the variable dimension, the resolution dimension, and the stage dimension. The quality-prediction performance is enhanced because the operational stage dimension is introduced, and more information is available.

The existing MRQP method adjusts the predictor variable dimension by controlling the variable resolution, which effectively avoids high-dimensional optimization. However, the MRQP can only make rough variable selections. For example, optimal resolution of a variable may vary at different production periods. Even in the same production period, the optimal variable resolution can be different. Moreover, the MRQP method selects only one resolution during the entire batch running or an entire operation phase. If too many production periods are separated, then the variable selection becomes much more complex.

Given the aforementioned observations, we study the data-driven batch-end quality modeling and monitoring for batch processes. The novelty and contributions of the current work are as follows.

1) The impact of variable selection on the batch-end quality prediction is analyzed to enhance the basic data-driven batch-end quality modeling and monitoring theory.
2) An optimized SPLS (OSPLS) modeling approach is proposed for efficient batch-end quality prediction. The OSPLS aims to achieve simultaneous quality prediction and relevant-variable selection by optimizing the variable resolution before SPLS modeling through a stochastic optimization approach. The resolution optimization conducts a rough variable selection, whereas the SPLS performs a further subtle variable selection.
3) A monitoring statistic is then established based on the selected quality-relevant variables to identify the difficult-to-measure batch-end quality status.
4) The advantages of the proposed OSPLS modeling scheme are theoretically analyzed. The OSPLS superiority is verified through experimental studies on the simulated fed-batch penicillin fermentation (FBPF) and an industrial injection molding (IIM).

The rest of this paper is organized as follows. Section II reviews the standard MPLS modeling approach and provides a motivational analysis on sparse modeling. Section III details the scheme and discusses the properties of OSPLS-based modeling. The experimental studies on the FBPF process and the IIM process are carried out in Section IV. Finally, Section V concludes this paper.

Notation: The notations used here are standard except where otherwise specified. The superscript "T" represents the transport of vectors or matrices. $|\cdot|$ refers to the absolute value of a scalar. $|\cdot|_1$ and $|\cdot|_2$ represent the L_1 and L_2 norm of vectors, respectively. $\mathrm{corr}(\boldsymbol{X}, \boldsymbol{Y})$ represents the correlation between $\boldsymbol{X}$ and $\boldsymbol{Y}$. $\boldsymbol{\Sigma}_X = \mathrm{var}(\boldsymbol{X})$ denotes the variance (covariance) of $\boldsymbol{X}$. $\lfloor a \rfloor$ represents the largest integer less than or equal to a. $\boldsymbol{S}_{XY}$ denotes the estimated covariance (from data) of $\boldsymbol{X}$ and $\boldsymbol{Y}$. $F_\alpha(a, b)$ denotes the F distribution with degrees of freedom a and b, and the level of significance α.

II. Preliminaries and Motivations

The standard MPLS for quality prediction is presented and the effect of irrelevant variables on prediction performance is analyzed. Then, the state-of-the-art SPLS and MRPLS approaches are reviewed, and the areas for improvements are discussed.

A. MPLS Basics

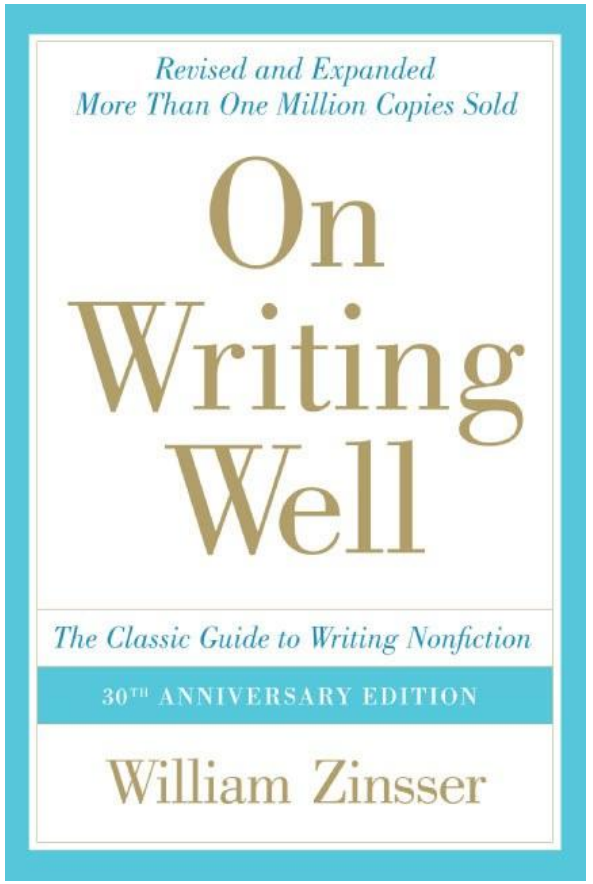
Assume a batch process that has J process sensors to measure process variants, a batch running consists of K sample points, and after a batch running M product-quality variables. After I batches, three-way tensor data consisting of the measured variables $\underline{\boldsymbol{X}}(I \times J \times K)$ and a quality matrix $\boldsymbol{Y}(I \times M)$ are obtained. Obtaining quality variables are generally costly or time consuming. Therefore, the establishment of an estimation model to predict the batch-end product quality is important.

The MPLS was proposed to deal with the three-way data, wherein three-way data are unfolded into two-way data, and then PLS modeling is performed on the two-way data [16]. Several data unfolding methods have been developed. We used the

四、引言

The most important sentence in any article is the first one. If it doesn't induce the reader to proceed to the second sentence, your article is dead. And if the second sentence doesn't induce him to continue to the third sentence, it's equally dead.

---- W. Zinsser



四、引言

➢ 如何评价一个Introduction

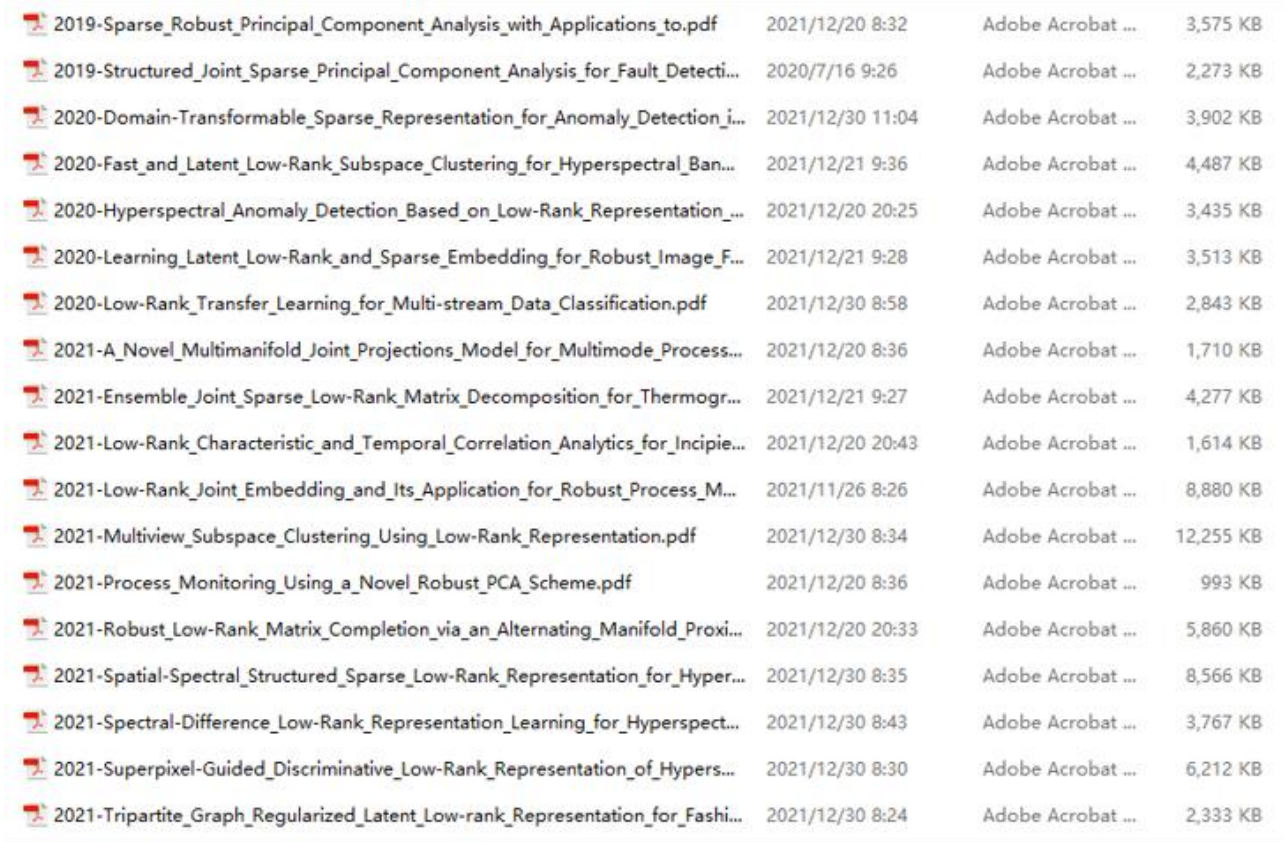
- 一个好的Introduction应该是让读者清晰的了解到论文做的问题是什么？与已有工作比较本文的问题有什么特点？本文得到结果的创新点是什么？应该使读者有想继续往下阅读的冲动。

“某某问题成为最近研究的热点[1-10]. 张三研究了…[1,2,3]，李四研究了…[4,5]，王二麻子研究了…[6-10]. 本文研究….

四、引言

➢ 写不好Introduction的原因

- 不知道Introduction的作用
- 所做的功课不够

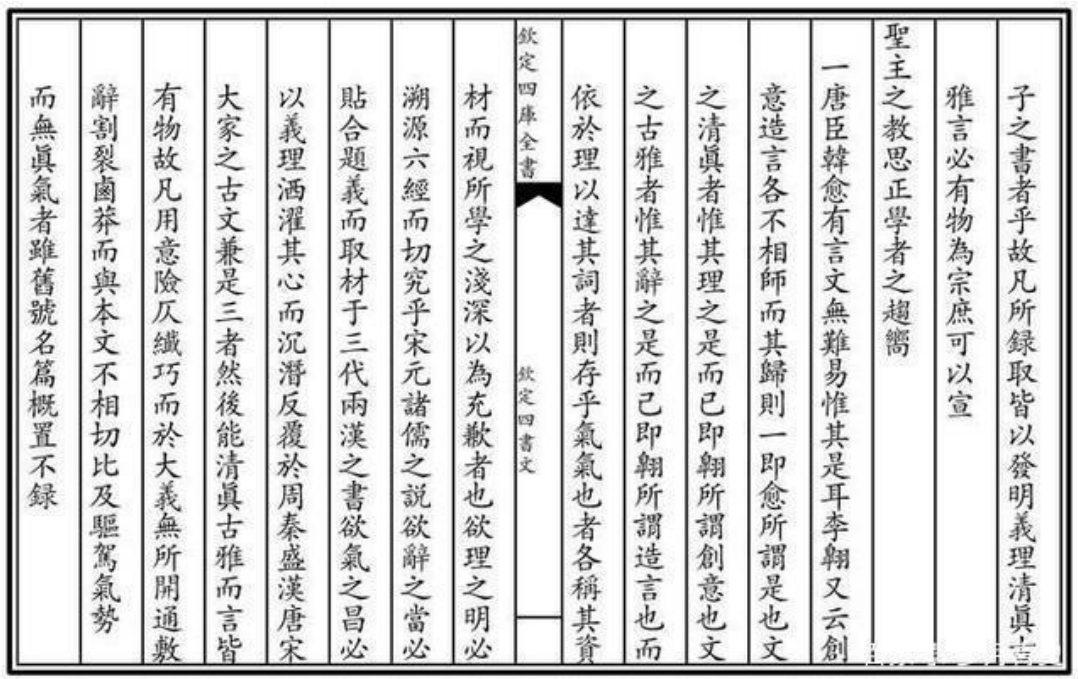


2019-Sparse_Robust_Principal_Component_Analysis_with_Applications_to.pdf	2021/12/20 8:32	Adobe Acrobat ...	3,575 KB
2019-Structured_Joint_Sparse_Principal_Component_Analysis_for_Fault_Detecti...	2020/7/16 9:26	Adobe Acrobat ...	2,273 KB
2020-Domain-Transformable_Sparse_Representation_for_Anomaly_Detection_i...	2021/12/30 11:04	Adobe Acrobat ...	3,902 KB
2020-Fast_and_Latent_Low-Rank_Subspace_Clustering_for_Hyperspectral_Ban...	2021/12/21 9:36	Adobe Acrobat ...	4,487 KB
2020-Hyperspectral_Anomaly_Detection_Based_on_Low-Rank_Representation_...	2021/12/20 20:25	Adobe Acrobat ...	3,435 KB
2020-Learning_Latent_Low-Rank_and_Sparse_Embedding_for_Robust_Image_F...	2021/12/21 9:28	Adobe Acrobat ...	3,513 KB
2020-Low-Rank_Transfer_Learning_for_Multi-stream_Data_Classification.pdf	2021/12/30 8:58	Adobe Acrobat ...	2,843 KB
2021-A_Novel_Multimanifold_Joint_Projections_Model_for_Multimode_Process...	2021/12/20 8:36	Adobe Acrobat ...	1,710 KB
2021-Ensemble_Joint_Sparse_Low-Rank_Matrix_Decomposition_for_Thermogr...	2021/12/21 9:27	Adobe Acrobat ...	4,277 KB
2021-Low-Rank_Characteristic_and_Temporal_Correlation_Analytics_for_Incipie...	2021/12/20 20:43	Adobe Acrobat ...	1,614 KB
2021-Low-Rank_Joint_Embedding_and_Its_Application_for_Robust_Process_M...	2021/11/26 8:26	Adobe Acrobat ...	8,880 KB
2021-Multiview_Subspace_Clustering_Using_Low-Rank_Representation.pdf	2021/12/30 8:34	Adobe Acrobat ...	12,255 KB
2021-Process_Monitoring_Using_a_Novel_Robust_PCA_Scheme.pdf	2021/12/20 8:36	Adobe Acrobat ...	993 KB
2021-Robust_Low-Rank_Matrix_Completion_via_an_Alternating_Manifold_Proxi...	2021/12/20 20:33	Adobe Acrobat ...	5,860 KB
2021-Spatial-Spectral_Structured_Sparse_Low-Rank_Representation_for_Hyper...	2021/12/30 8:35	Adobe Acrobat ...	8,566 KB
2021-Spectral-Difference_Low-Rank_Representation_Learning_for_Hyperspect...	2021/12/30 8:43	Adobe Acrobat ...	3,767 KB
2021-Superpixel-Guided_Discriminative_Low-Rank_Representation_of_Hypers...	2021/12/30 8:30	Adobe Acrobat ...	6,212 KB
2021-Tripartite_Graph_Regularized_Latent_Low-rank_Representation_for_Fashi...	2021/12/30 8:24	Adobe Acrobat ...	2,333 KB

四、引言

➢ 常见写法

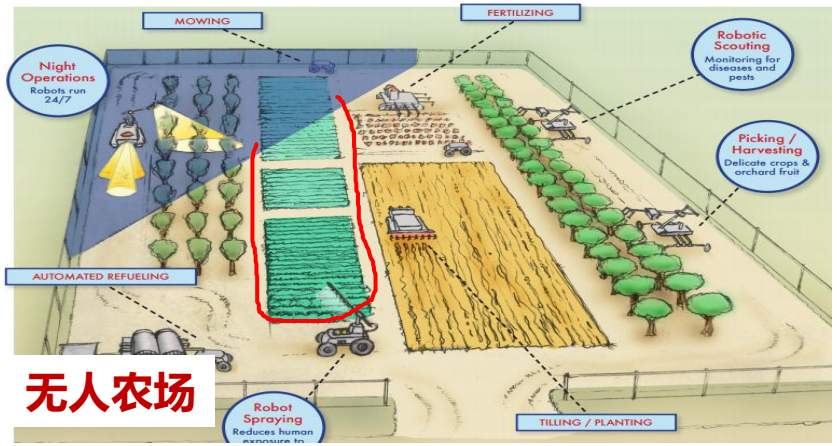
三段式：研究背景、现有工作、新的结果


子之書者乎故凡所録取皆以發明義理清眞古
雅言必有物為宗庶可以宣
聖主之教思正學者之趨嚮
一唐臣韓愈有言文無難易惟其是耳李翺又云創
意造言各不相師而其歸則一即愈所謂是也文
之清眞者惟其理之是而已即翺所謂創意也文
之古雅者惟其辭之是而已即翺所謂造言也而
依於理以達其詞者則存乎氣氣也者各稱其資
欽定四庫全書
材而視所學之淺深以為充歉者也欲理之明必
溯源六經而切究乎宋元諸儒之説欲辭之當必
貼合題義而取材于三代兩漢之書欲氣之昌必
以義理洒濯其心而沉潛反覆於周秦盛漢唐宋
大家之古文兼是三者然後能清眞古雅而言皆
有物故凡用意險仄纖巧而於大義無所開通敷
辭割裂鹵莽而與本文不相切比及驅駕氣勢
而無眞氣者雖舊號名篇概置不録

四、引言

➢ 主要作用

1、引出要研究问题及其背景，让读者认识到问题在理论或应用等方面有意义。



无人农场

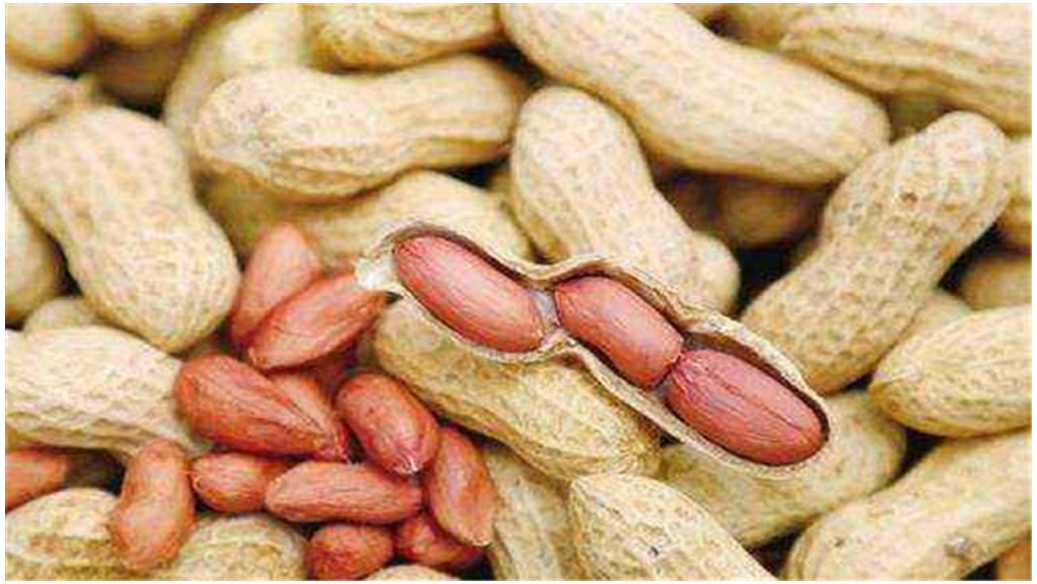
四、引言

- ... has important applications from …[1]-[5], to …[6]-[10]. In the case of …
- … is best known as a classical problem in …[1-5], but has applications to such areas as ….[6-10].
- Recent work in… has drawn attention to …. These arise in problems of … [1], [2], … [5], [6], …[8] and … [10].
- Among many systems of practical interest, … can be modeled as … systems. It is well known that …[1].
- In the … literature, one usually ….[1,2] However, in practice, … cannot be easily …[3]
- These arise in problems of … for … [1], … [2, 3], …[4].

四、引言

➢ 主要作用

2、介绍问题的研究进展，作为一个问题它一定有生长点，即研究前沿，否则问题就不具有创新性。



四、引言

- … is usually viewed as …
- Such an approach therefore introduces
- The … problems which are treated in this paper through … theoretic means have a long mathematical history, independent of control theory, and whose solutions, we believe, are of interest to the contemporary mathematical community.(特别是抽象称比较理论的数学问题时)
- In doing so, we shall necessarily be drawn to the theory of … and to the theory of ….
- Let us begin with, a brief history of the … problem.
- The … problem can be stated as follows: Given a … and an object capable of …, find a ….
- … show that the … often generates inaccurate results [5]. Therefore, is desirable

四、引言

- … have been previously used in the … context in … [22] and, recently, their ability to represent … has gained appreciation in … analysis [23], [24].
- The use of the … is not a new concept, it has appeared in the context of the stabilization of … systems [25], [26], … control [2]-[5] and, more recently, …problems [20], [27]-[30].
- This class of control laws contains the attitude control law first proposed in [9] as a special case.
- In [15] this was proven to be…. However, in the recently developed extended theory of …[5,17] it was shown that in fact there exist ….
- With the novel use of …, first introduced in [20], this framework allows for robustness analysis with respect to parameter error, signal noise, and

四、引言

➢ 主要作用

3、与已有研究的比较，本文研究的问题有什么不同？特点是什么？

目的是强调本文工作的不同、特点、意义、创新等

四、引言

- A complicated Lyapunov analysis is used in [18] to produce a globally asymptotically stable control law that is more complex than the ones presented here.
- Global stability of the controllers in this paper is shown based on … together with a Lyapunov analysis. … As noted in [3], no globally asymptotically stable control law that is also continuous on … exists.
- As pointed out in [3], … feedback control also produces an unstable equilibrium. … This may lead to an undesirable situation where…. We have derived a sufficient condition to avoid this situation.
- Global stability of the control law in [9] is shown here. This control law is computationally efficient and performs almost identically to the globally asymptotically stable control law for small errors.
- In contrast to

四、引言

➢ 主要作用

4、介绍本文得到的结果，强调创新性。

- 若画龙，这是点睛。
- 创新点要自己写明确，不能让读者看完论文后提炼。
- 写时要有底气，底气不足只能说明你自己都不知道有何新意，要想发表更难。

四、引言

- The stability of a large number of control laws is shown in this paper, including… control. Most of these control laws are new; the … control laws in [3], and the … control in [4], [5] are special cases of the more general control laws developed here.
- A… we added in the Lyapunov function is critical for the derivation of the new results in this paper. This technique has been used in … control [20] but not in the … control literature. The … has also been used in [3]-[5], [19], but without ….
- But more importantly, the paper contains original results and gives new interpretations to old results.
- …, this paper provides two main contributions. First…. To the best of our knowledge it is the first time such a general result has been reported. We

first time

四、引言

- 不宜过多，通常2-4条即可；
- 常用格式如

The main contributions of this paper are given as follows

of industrial processes. The goals of the current work can be summarized as the following four aspects:

1) To construct a robust multivariate statistical PM method by filtering out minor faults.
2) To enhance the representation of process variables using nonconvex regularization.
3) To preserve the local geometric prior via incorporating manifold learning.
4) To develop an iterative optimization strategy along with convergence guarantee.

As such, the main purpose of this paper is to provide satisfactory answers to these three questions. The primary contributions of this paper are highlighted as the following fourfold.

1) The MHE problem is, for the first time, studied for networked time-delay systems subject to the RR scheduling.
2) A lifting method is applied to reformulate the time-delay system into a delay-free system.
3) A sufficient condition is established under which the estimation error is ultimately bounded.
4) Two optimization problems (OPs) are addressed to obtain the desired estimator parameters according to two different estimation performance requirements.

四、引言

➢ 主要作用

5、给出论文的内容安排。

- The rest of this paper is organized as follows. Section II provides ….
  Section III presents … Some simulation results are given in Section IV.
- The paper is organized as follows: Section 2 introduces basic assumptions, includes … considered. A … is presented in Section 3. The … and the … are the main topic of Sections 4 and 5, respectively. Section 6 illustrates simulation results. Conclusions are given in Section 7.

四、引言

The rest of this article is organized as follows. Section II reviews the basis of multimanifold learning. Section III presents the proposed MMJP model. in Section IV, the corresponding process monitoring scheme based on MMJP is introduced. Section V presents two case studies on a numerical example as well as the TE benchmark process. Finally, Section VI concludes this article.

四、引言

➢ 注意事项：文献引用

- 应引用“最相关”的文献以指引读者. 力戒刻意回避引用最重要的相关文献(甚至是对作者研究具有某种“启示”性意义的文献)；
- 避免不恰当地大量引用作者本人的文献；

！！！审稿人：Some related methods are missing in the current version. For example。。。

REFERENCES

[1] A. Alessandri and M. Gaggero, “Fast moving horizon state estimation for discrete-time systems using single and multi iteration descent methods,” *IEEE Trans. Autom. Control*, vol. 62, no. 9, pp. 4499–4511, Sep. 2017.

[2] A. Alessandri, M Baglietto, and G. Battistelli, “Robust receding-horizon estimation for uncertain discrete-time linear systems,” *Syst. Control Lett.*, vol. 54, no. 7, pp. 627–643, Jul. 2005.

[3] A. Alessandri and M. Awawdeh, “Moving-horizon estimation with guaranteed robustness for discrete-time linear systems and measurements subject to outliers,” *Automatica*, vol. 67, pp. 85–93, May 2016.

[4] R. Caballero-Águila, A. Hermoso-Carazo, and J. Linares-Pérez, “Optimal state estimation for networked systems with random parameter matrices, correlated noises and delayed measurements,” *Int. J. General Syst.*, vol. 44, no. 2, pp. 142–154, Feb. 2015.

[5] D. Ding, Z. Wang, B. Shen, and H. Dong, “$\mathcal{H}_\infty$ state estimation with fading measurements, random varying nonlinearities and probabilistic distributed delays,” *Int. J. Robust Nonlinear Control*, vol. 25, no. 13, pp. 2180–2195, Sep. 2015.

四、引言

➢ 注意事项：名词解释

- 解释或定义专门术语或缩写词，以帮助编辑、审稿人和读者阅读与理解；

Index Terms—Data driven, degradation process, remaining useful life (RUL).

I. Introduction

SAFETY and reliability is the primary concern of modern industrial production. In order to ensure safety and reliability, techniques such as multivariate statistic process control (MSPC) have been widely used [1]. Different kinds of MSPC methods have been proposed in the literature in the past few years, such as canonical variate analysis (CVA) [2], canonical correlation analysis (CCA) [3], [4], probabilistic latent variable model [5], [6], and quality-related MSPC approaches [7], [8]. Despite the aforementioned progress, principal component anal-

Acronyms

AIC	Akaike information criterion.
BM	Brownian motion.
CM	Condition monitoring.
FHT	First hitting time.
MLE	Maximum likelihood estimation.
MSE	Mean squared error.
PDF	Probability density function.
PHM	Prognostics and health management.

四、引言

➢ 注意事项：人称

- 适当地使用“We”或“Our”，“This paper”等词，以明确地指示作者本人的工作；如

We conducted this study to determine whether…

This paper presents a new approach that process the data more efficiently.

Summarizing the discussions above, in this paper, we aim to deal with the MHE problem for time-delay systems with the RR protocol scheduling. This is a nontrivial task because of the following three identified difficulties:

Motivated by the above works, in this paper, we propose a non-negative sparse hyper-Laplacian regularized low-rank representation model, or NSHLRR for short, for image

四、引言

➢ 注意事项：时态

- 现在时：叙述有关现象或普遍事实；

little is known about…

- 现在完成时：描述最近的某种趋势，或者强调表示某些“最近”发生的事件对现在的影响；

few studies have been done on …

- 一般过去时：叙述过去特定行为或特定现象；

found that reducing the amount of …

四、引言

➢ 注意事项：时态

- 现在时：叙述有关现象或普遍事实；
- 现在完成时：描述最近的某种趋势，或者强调表示某些“最近”发生的事件对现在的影响；
- 一般过去时：叙述过去特定行为或特定现象；

The LRR method [11], [30], [31], [33] focuses on low-rank data representation, based on the hypothesis that data approximately jointly span several low-dimensional subspaces. The authors of [32] generalize LRR model to take care of largely contaminated outliers by incorporating a ℓ_1/ℓ_2 noise model and prove that under mild technical conditions, the LRR model exactly recovers the subspace of samples and detect the outliers as well. Thus LRR can accurately recover the row space of the original data and detect outliers under mild conditions [30]. In general, the resulting problem, which minimizes a combination of the nuclear norm and the ℓ_1-norm, is convex and can be solved in polynomial time [10]. In order to handle the cases where the number of observed data is insufficient or data themselves are too badly corrupted, Liu and Yan [33] further proposed a latent low-rank representation approach. In the latent LRR, hidden data can be regarded as the input data matrix after being transposed. This idea has been recently used in designing a classifier for image classification [4]. As for LRR, only the

四、引言

➢ 注意事项：论文结构

- 也有一些期刊不要求，如TII、TIE、TAC

The contribution and benefits of the proposed method are as follows.

1) SJSPCA is introduced to enhance fault-isolation performance of conventional PCA based approaches.
2) SJSPCA uses graph Laplacian regularization term that is able to incorporate *a priori* information on variable structure/correlation, so that faulty variables that are correlated can be effectively isolated.
3) By using a moving window based approach, a two-stage fault-isolation strategy is proposed for online application.
4) It is proved that the proposed strategy is capable of isolating faulty variables.
5) The "smearing effect" can be remarkably reduced.

II. Joint Sparse PCA

Notations: $\mathbb{R}^n$ and $\mathbb{R}^{n\times m}$ denote, respectively, the n-dimensional Euclidean space and set of all $n \times m$ real matrices. $\mathbb{N}$ ($\mathbb{N}^+, \mathbb{N}^-$) denote, respectively, the set of integers (nonnegative integers and negative integers), and the set of all nonnegative real numbers is denoted by $\mathbb{R}^+$. The notation $X \geq Y$ ($X > Y$), where X and Y are real symmetric matrices, means that $X - Y$ is positive semidefinite (positive definite). M^T represents the transpose of the matrix M. If A is a matrix, $\lambda_{\max}\{A\}$ ($\lambda_{\min}\{A\}$) stands for the maximum (minimum) eigenvalue of A, and $\mathrm{tr}\{A\}$ represents the trace of A. 0 represents the zero matrix of compatible dimensions. The n-dimensional identity matrix is denoted as I_n or simply I, if no confusion is caused. The shorthand $\mathrm{diag}\{\cdots\}$ stands for a block-diagonal matrix and the notation $\mathrm{diag}_n\{\bullet\}$ is employed to stand for $\mathrm{diag}\{\underbrace{\bullet,\ldots,\bullet}_{n}\}$. $\mathbb{E}\{x\}$ and $\mathbb{E}\{x|y\}$ will, respectively, denote expectation of the stochastic variable x and expectation of x conditional on y. Given a generic vector x, $\|x\|$ describes the Euclidean norm of x and, for a given positive definite matrix P, $\|x\|_P$ denotes the weighted norm of x : $\|x\|_P \triangleq \sqrt{x^T Px}$. In symmetric block matrices, "*" is used as an ellipsis for terms induced by symmetry. For an integer a and a positive integer b, the function $\mathrm{mod}(a, b)$ represents the unique nonnegative remainder on division of the integer a by the positive integer b. The Kronecker delta function

四、引言

➢ 常用表达

- 以however，few，little和no等表示指出过去研究的不足或目前仍缺少某些资料，并引出作者的研究问题；
- 以although，while引导，或以but，yet转折的复合句来提出问题；
- 有时作者在引言中还可较谦虚的，或者试探性的指出自己研究的价值，其中常用的助动词有may，should，could等；

- However，few studies have been done on …
- Although much research has been done on…，little work has been done on…
- These findings may be useful to researchers attempting to increase employee productivity…

四、引言

➢ 总结

- Choose references carefully and seriously;
- Keep exposition flowing smoothly and logically;
- Much of is should be written in the present tense;
- Do not keep the reader in suspense.

A bad beginning makes a bad ending.

四、引言

- 例子

Our program, AlphaGo Zero, differs from AlphaGo Fan and AlphaGo Lee[12] in several important aspects. First and foremost, it is trained solely by self-play reinforcement learning, starting from random play, without any supervision or use of human data. Second, it uses only the black and white stones from the board as input features. Third, it uses a single neural network, rather than separate policy and value networks. Finally, it uses a simpler tree search that relies upon this single neural network to evaluate positions and sample moves, without performing any Monte Carlo rollouts. To achieve these results, we introduce a new reinforcement learning algorithm that incorporates lookahead search inside the training loop, resulting in rapid improvement and precise and stable learning. Further technical differences in the search algorithm, training procedure and network architecture are described in Methods.

提纲

五 方法

六 结果

七 结论

五、方法

➢ 内容

- 应清楚、准确描述是如何获得研究结果的；
- 对方法的描述要详略得当、重点突出；

Table 1
X-deflated NIPALS algorithm (Dayal & MacGregor, 1997).

Center the columns of $\mathbf{X}$, $\mathbf{Y}$ to zero mean and scale them to unit variance. Set $i = 1$ and $\mathbf{X}_1 = \mathbf{X}$.
1. Set $\mathbf{u}_i$ equal to any column of $\mathbf{Y}$.
2. $\mathbf{w}_i = \mathbf{X}_i^{\mathrm{T}}\mathbf{u}_i / \|\mathbf{X}_i^{\mathrm{T}}\mathbf{u}_i\|$.
3. $\mathbf{t}_i = \mathbf{X}_i\mathbf{w}_i$.
4. $\mathbf{q}_i = \mathbf{Y}^{\mathrm{T}}\mathbf{t}_i / \mathbf{t}_i^{\mathrm{T}}\mathbf{t}_i$.
5. $\mathbf{u}_i = \mathbf{Y}\mathbf{q}_i$.

If $\mathbf{t}_i$ converges, go to Step 6, else return to Step 2.
6. $\mathbf{p}_i = \mathbf{X}_i^{\mathrm{T}}\mathbf{t}_i / \mathbf{t}_i^{\mathrm{T}}\mathbf{t}_i$.
7. $\mathbf{X}_{i+1} = \mathbf{X}_i - \mathbf{t}_i\mathbf{p}_i^{\mathrm{T}}$.

Set $i = i + 1$ and return to step 1. Terminate if $i > A$.

discuss the effect of $\mathbf{Y}$ on the $\mathbf{X}$-space decomposition in Section 3. The geometric properties of PLS on $\mathbf{X}$-space decomposition are discussed in Section 4. Other PLS variants are analyzed in a similar way. Following that, we discuss the monitoring problem using PLS and its variants in Section 5. Section 6 uses a numerical example and a case study to illustrate the analysis results. Finally, we present conclusions in the last section.

2. Projection to latent spaces (PLS)

Given an input matrix $\mathbf{X} \in \mathbb{R}^{n\times m}$ consisting of n samples with m process variables per sample, and an output matrix $\mathbf{Y} \in \mathbb{R}^{n\times p}$ with p quality variables per sample, PLS projects $(\mathbf{X}, \mathbf{Y})$ to a low-dimensional space defined by a small number of latent variables $(\mathbf{t}_1, \ldots, \mathbf{t}_A)$ (A is the PLS component number) as follows:

$$\begin{cases} \mathbf{X} = \mathbf{T}\mathbf{P}^{\mathrm{T}} + \mathbf{E} \\ \mathbf{Y} = \mathbf{T}\mathbf{Q}^{\mathrm{T}} + \mathbf{F} \end{cases} \tag{1}$$

where $\mathbf{T} = [\mathbf{t}_1, \ldots, \mathbf{t}_A]$ is the score matrix, $\mathbf{P} = [\mathbf{p}_1, \ldots, \mathbf{p}_A]$ is the loading matrix for $\mathbf{X}$ and $\mathbf{Q} = [\mathbf{q}_1, \ldots, \mathbf{q}_A]$ is the loading matrix for $\mathbf{Y}$. $\mathbf{E}$ and $\mathbf{F}$ are the modeling residual of $\mathbf{X}$ and $\mathbf{Y}$. The data matrices $\mathbf{X}$, $\mathbf{Y}$ are usually scaled to unit variance and zero mean. A nonlinear iterative partial least-squares algorithm (NIPALS) to perform PLS is described in Table 1. The objective of PLS embedded in this algorithm is to find the solution of the following problem:

$$\begin{aligned} &\max \quad \mathbf{w}_i^{\mathrm{T}}\mathbf{X}_i^{\mathrm{T}}\mathbf{Y}_i\mathbf{q}_i \\ &s.t. \quad \|\mathbf{w}_i\| = 1, \|\mathbf{q}_i\| = 1 \end{aligned}$$

where $\mathbf{w}_i$, $\mathbf{q}_i$ are weight vectors that yield $\mathbf{t}_i = \mathbf{X}_i\mathbf{w}_i$ and $\mathbf{u}_i = \mathbf{Y}_i\mathbf{q}_i$, respectively. Denoting $\mathbf{W} = [\mathbf{w}_1, \ldots, \mathbf{w}_A]$, $\mathbf{T}$ cannot be calculated from $\mathbf{X}$ directly using $\mathbf{W}$. Let

$$\mathbf{r}_1 = \mathbf{w}_1, \quad \mathbf{r}_i = \prod_{j=1}^{i-1}(\mathbf{I}_m - \mathbf{w}_j\mathbf{p}_j^{\mathrm{T}})\mathbf{w}_i, \quad i > 1 \tag{2}$$

3. The effect of Y on the X-space decomposition

Many researchers use the PCA-based monitoring techniques for PLS decomposition of the $\mathbf{X}$-space. However, the PLS decomposition can be radically different from the PCA decomposition, which makes one wonder whether the PLS-based monitoring should be different from the PCA-based monitoring techniques. In this section, we demonstrate the impact of $\mathbf{Y}$ on the decomposition of $\mathbf{X}$-space in general, and then visualize the result geometrically.

Suppose $\mathbf{X}$ has the following PCA decomposition:

$$\mathbf{X} = \mathbf{t}_1\mathbf{v}_1^{\mathrm{T}} + \cdots + \mathbf{t}_l\mathbf{v}_l^{\mathrm{T}} \tag{6}$$

where $\mathbf{v}_i$ $(1 \le i \le l)$ are the orthonormal eigenvectors related to nonzero eigenvalues of $\mathbf{X}^{\mathrm{T}}\mathbf{X}$, $\lambda_1 \ge \cdots \ge \lambda_l > 0$ and $l = rank(\mathbf{X}) \le m$. In PCA $\mathbf{v}_i$ $(1 \le i \le l)$ alone define the decomposition of the input space. In PLS however, the input space decomposition is defined by two matrices, $\mathbf{P}$ and $\mathbf{R}$. Therefore, the angle between $\mathbf{r}_i$ and $\mathbf{p}_i$, unless it is zero, reflects the impact of $\mathbf{Y}$ on the decomposition of $\mathbf{X}$-space in PLS. For the ease of presentation, we drop the subscript i for the moment.

The PLS weight vector $\mathbf{r}$ is in $\mathrm{Span}\{\mathbf{v}_1, \ldots, \mathbf{v}_l\}$ according to the properties of PLS. Therefore,

$$\mathbf{r} = r\sum_{i=1}^{l}\alpha_i\mathbf{v}_i \tag{7}$$

where $r = \|\mathbf{r}\|$ and

$$\sum_{i=1}^{l}\alpha_i^2 = 1. \tag{8}$$

Then,

$$\mathbf{p} = \mathbf{X}^{\mathrm{T}}\mathbf{t}/\mathbf{t}^{\mathrm{T}}\mathbf{t} = \frac{\mathbf{X}^{\mathrm{T}}\mathbf{X}\mathbf{r}}{\mathbf{t}^{\mathrm{T}}\mathbf{t}} = \frac{\sum_{i=1}^{l}\lambda_i\alpha_i\mathbf{v}_i}{r\sum_{i=1}^{l}\lambda_i\alpha_i^2}. \tag{9}$$

From (5), we have $\mathbf{r}^{\mathrm{T}}\mathbf{p} = 1$ for each dimension. Therefore,

$$\cos\angle(\mathbf{r}, \mathbf{p}) = \frac{1}{r\|\mathbf{p}\|} = \frac{\sum_{i=1}^{l}\lambda_i\alpha_i^2}{\sqrt{\sum_{i=1}^{l}\lambda_i^2\alpha_i^2}} \tag{10}$$

and

$$\max\angle(\mathbf{r}, \mathbf{p}) = \arccos\frac{2\sqrt{\lambda_1\lambda_l}}{\lambda_1 + \lambda_l}. \tag{11}$$

五、方法

➢ 内容

- 应清楚、准确描述是如何获得研究结果的；
- 对方法的描述要详略得当、重点突出；

所有必要的细节（以便他人能够重复）；

Data availability

The data that support the plots within this paper and other findings of this study are available from the corresponding authors upon reasonable request.

Code availability

All the code or mathematical algorithm files within this paper are available from the corresponding authors upon reasonable request.

Article

Methods

Sample growth

A water-soluble SAO layer was grown first on a (001) STO single-crystalline substrate (MTI Corp.) followed by the growth of STO and PTO by a DCA Dual R450 Oxide MBE system. The SAO and STO films were grown with an oxidant (10% O_3 and 90% O_2) background pressure P_{O_2} of 1×10^{-6} torr and at $T_{substrate}$ = 950 °C in a layer-by-layer growth mode, of which the thickness was monitored by reflection high-energy electron diffraction oscillations. The PTO films were grown with an oxidant (distilled O_3) P_{O_2} of 2×10^{-5} torr and at $T_{substrate}$ = 625 °C. Owing to the volatility of lead, PTO films were grown in adsorption-controlled mode with a fixed lead:titanium flux ratio of 13:1, and the thickness was controlled by the shutter time of titanium evaporation source.

Structure characterizations

The crystal structure was examined by a high-resolution four-circle X-ray diffractometer using a Bruker D8 Discover instrument. The incident X-ray is from Cu K_α emission and has a wavelength of 1.5418 Å.

Selected area electron diffraction and S/TEM experiments

Selected area electron diffraction patterns were acquired on an FEI Tecnai F20 TEM at 200 kV from a flat area of the samples suspended on holey carbon films or microcarbon grids. A low electron beam current (0.045 nA) and a short exposure time (2.0 s) were used to reduce the electron beam damage. The probe convergence angle on Titan was 25 mrad, and the angular range of the HAADF detector was from 79.5 mrad to 200 mrad.

五、方法

- 写作要点Be Precise, be careful.
  - 明确描述实验对象和方法的选择；

Minor comments:

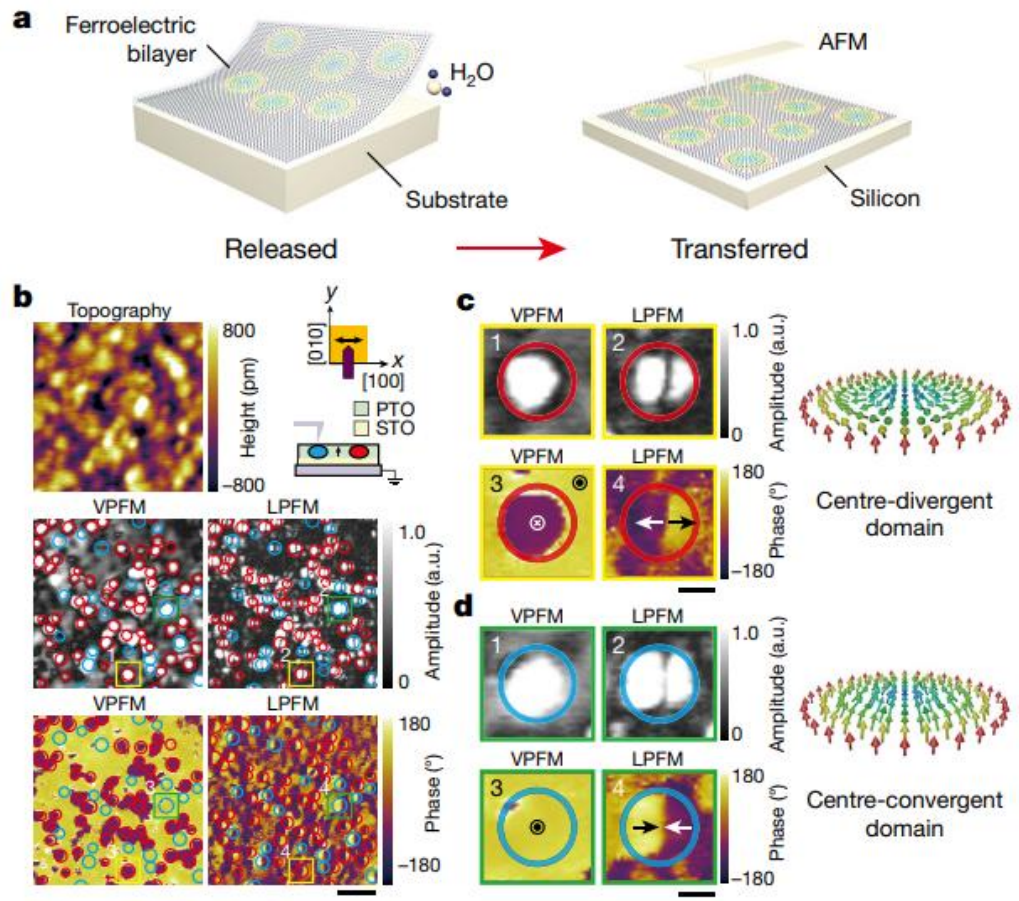
Page III, Section III, Page 3, Right Column, Lines 34-35"... Notice that the inverses of some matrices only need to be calculated once in the iterations, so the overall computational complexity is acceptable...". This is a strong statement that needs to be given emphasis since it relates to the overall computational complexity.

Page V, Section IV, Page 5, Left Column, Lines 34-36 "... the local geometric manifold structure of fault samples can be captured and preserved, thereby making the monitoring more robust to corruptions..." the robust to corruptions should have a basis and it needs to be briefly mentioned such as in a phrase or a short sentence.

五、方法

- 写作要点Be Precise, be careful.
  - 明确描述实验对象和方法的选择；
  - 详细描述实验方法和实验步骤；

How,
How much,
What conditions,
…



五、方法

- 写作要点Be Precise, be careful.
  - 明确描述实验对象和方法的选择；
  - 详细描述实验方法和实验步骤；
  - 准确记载所采用药物和化学试剂的名称、剂量、给药途径；

6.1. A numerical example

Consider the following numerical example first:

$$\begin{cases} \mathbf{x}_k = \mathbf{A}\mathbf{z}_k + \mathbf{e}_k \\ y_k = \mathbf{C}\mathbf{x}_k + v_k \end{cases} \tag{32}$$

where $\mathbf{A} = \begin{pmatrix} 1 & 4 & 4 \\ 2 & 0 & 1 \end{pmatrix}^{\mathrm{T}}$, $\mathbf{z}_k \sim \mathbf{N}(\mathbf{0}, 0.5^2\mathbf{I}_2)$, $\mathbf{e}_k \sim \mathbf{N}(0, 0.05^2\mathbf{I}_3)$, $v_k \sim N(0, 0.05^2)$, $\mathbf{C} = \begin{pmatrix} 2 & 2 & 1 \end{pmatrix}$. The fault is added in the following form:

$$\mathbf{x}_k = \mathbf{x}_k^* + \Xi f \tag{33}$$

nature biotechnology

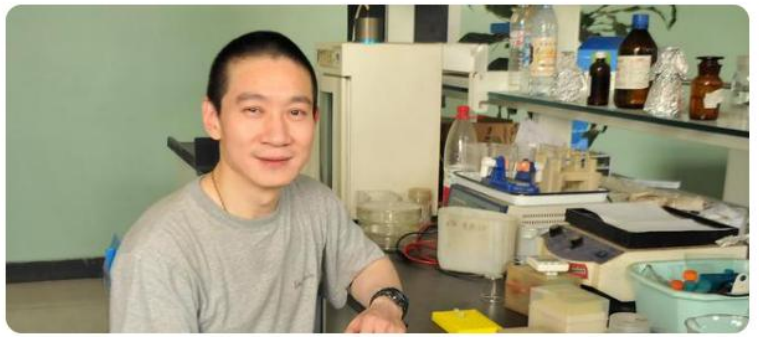
DNA-guided genome editing using the *Natronobacterium gregoryi* Argonaute

Feng Gao[1], Xiao Z Shen[2], Feng Jiang[1], Yongqiang Wu[1] & Chunyu Han[1]

The RNA-guided endonuclease Cas9 has made genome editing a widely accessible technique. Similar to Cas9, endonucleases from the Argonaute protein family also use oligonucleotides as guides to degrade invasive genomes. Here we report that the *Natronobacterium gregoryi* Argonaute (NgAgo) is a DNA-guided endonuclease suitable for genome editing in human cells. NgAgo binds 5′ phosphorylated single-stranded guide DNA (gDNA) of ~24 nucleotides, efficiently creates site-specific DNA double-strand breaks when loaded with the gDNA. The NgAgo–gDNA system does not require a protospacer-adjacent motif (PAM), as does Cas9, and preliminary characterization suggests a low tolerance to guide–target mismatches and high efficiency in editing (G+C)-rich genomic targets.

韩春雨事件的时间线：

2016年5月8日，多家媒体以一鸣惊人为题，先后报道韩春雨的论文成果；**2016年5月27日**，首个声称未能重复韩春雨实验的帖子在未名空间BBS出现，作者据称来自中科院上海分院；**2016年7月13日**，韩春雨当选为河北省科协副主席，并在当月被河北科大推荐为“长江学者奖励计划”候选人。



五、方法

- 写作要点Be Precise, be careful.
  - 明确描述实验对象和方法的选择；
  - 详细描述实验方法和实验步骤；
  - 准确记载所采用药物和化学试剂的名称、剂量、给药途径；
  - 列举建立方法的参考文献，并做简要描述（但不需全部重复描述）；

4. Experiments

We compare the following methods in the multi-view learning setting, focusing on several downstream tasks: noisy digit image classification, speech recognition, and word pair semantic similarity.

DNN-based models, including SplitAE, CorrAE, DCCA, DCCAE, and DistAE.

Linear CCA (CCA), corresponding to DCCA with only a linear network without hidden layers for both views.

Kernel CCA approximations. Exact KCCA is intractable for our tasks; we instead implement two kernel approximation techniques, using Gaussian RBF kernels. The first implementation, denoted **FKCCA**, uses random Fourier features (Lopez-Paz et al., 2014) and the second implementation, denoted **NKCCA**, uses the Nyström approximation (Williams & Seeger, 2001). As described in Sec. 3.2, in FKCCA/NKCCA we transform the original inputs to an M-dimensional feature space where the inner products between samples approximate the kernel similarities (Yang et al., 2012). We apply linear CCA to the transformed inputs to obtain the approximate KCCA solution.

五、方法

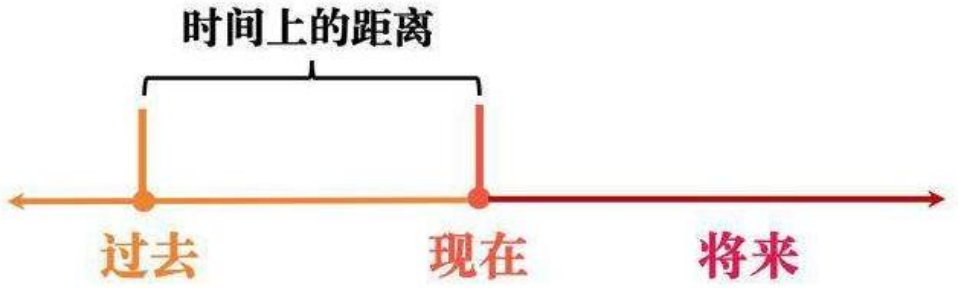
➢ 时态

- 现在时：不受时间影响的事实；

A twin-lens reflex camera is actually a combination of …

- 过去时：过去特定的行为或事件；

The work was carried out on the Imperial College gas atomizer, which has been described in detail elsewhere.



五、方法

➢ 语态

- 由于所涉及的行为与材料是讨论的重点，且读者已知道进行这些行为的人就是作者，因而一般采用被动语态；

The samples were immersed in an ultrasonic bath for 3 minutes in acetone followed by 10 minutes in distilled water. (建议使用)

We immersed the samples in an ultrasonic bath for 3 minutes in acetone followed by 10 minutes in distilled water. (避免使用)

五、方法

➢ 语态

- 如果涉及表达作者的观点或看法，则应采用主动语态或不定式结构；

For the second trial, the apparatus was covered by a sheet of plastic. We believed this modification would reduce the amount of scattering. (建议使用)

For the second trial, the apparatus was covered by a sheet of plastic. It was believed that this modification would reduce the amount of scattering.(建议使用)

五、方法

➢ 例子

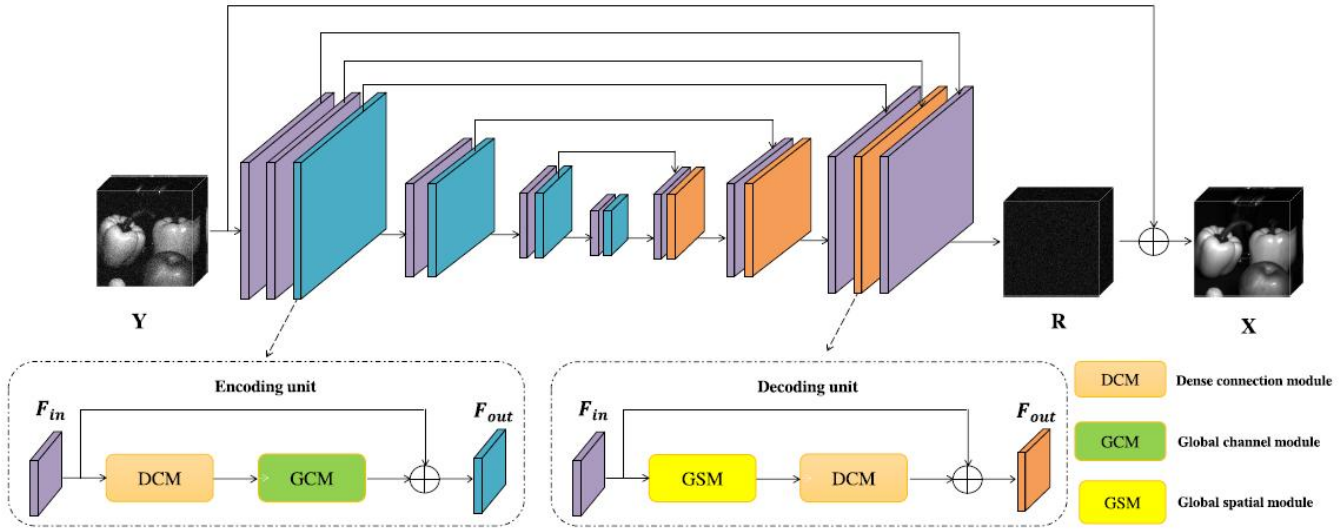


Fig. 1. Overall architecture of our global reasoning network for HSI denoising. The network consists of encoding and decoding units. The encoding unit contains the DCM and the GCM, while the decoding unit contains the GSM and the DCM.

A. Overall Network Architecture

The proposed network adopts the U-net architecture [37] as the backbone, and the advantages of the U-net are three folds: First, the skip connections in U-net allow the restored feature map in the decoding stage to contain more low-level features and promotes gradient back-propagation, which make the restored image more realistic and help network training

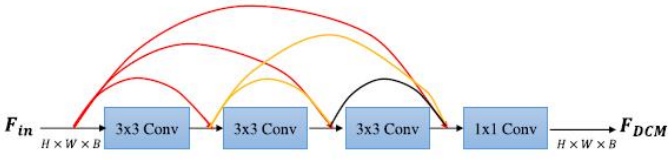


Fig. 2. Architecture of DCM.

五、方法

- 例子

4 Methodology

As it has already been discussed, our approach builds on ideas from the areas of pose extraction and domain adaptation. We now give some technical details regarding: (a) the extraction of skeletal joint information from video; (b) the representation used for capturing spatial and temporal properties of the aforementioned information during the performance of some activity; (c) the classification approach we follow; and finally, (d) the adversarial domain adaptation we propose.

4.1 Classification

As it has been already mentioned, for human activity recognition tasks human motion is typically captured by depth cameras, which extract both RGB video and depth maps per video frame, i.e. an extra video channel where the value of each pixel is related to the depth of the corresponding object to the image plane. Our approach utilizes the modality that corresponds to the motion of joints in 3D space. More specifically, we require as input 3D trajectories of skeletal joints (i.e. x, y and z coordinates at each frame for each) during an action.

We work with 3D skeletal data that have been captured with the Microsoft Kinect v2 sensor. These data consist of 25 human joints per skeleton. The set of skeletal joints is illustrated in Fig. 2. Up to 6 skeletons can be simultaneously extracted in real-time using the Kinect SDK. Therein, a human skeleton corresponds to a graph; nodes correspond to body parts such as arms, legs, head, neck and so on, while edges follow the body structure. Moreover, a parent-child relationship is implied. For example, the joint "HEAD" is parent of "NECK," while the "NECK" is the

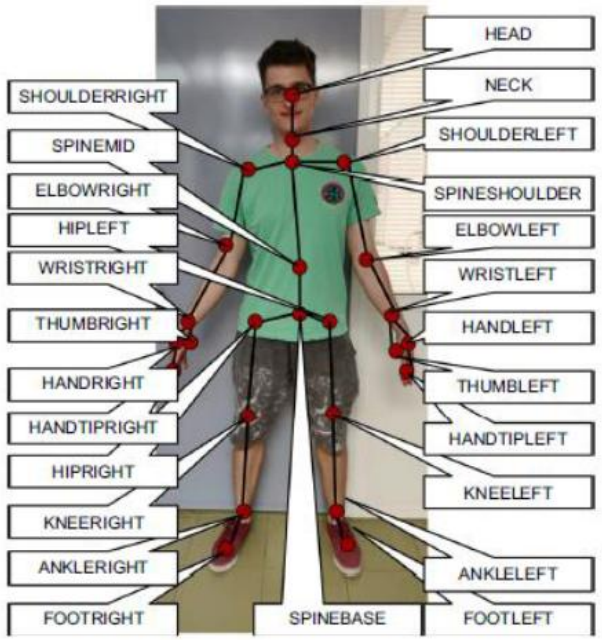


Fig. 2 Extracted human skeleton 3D joints using the Kinect SDK

提纲

五 方法

六 结果

七 结论

六、结果

➢ 要点

- 对实验或观察结果的表达要高度概括和提炼（按逻辑顺序描述或总结重要的观察结果）；
- 数据表达可采用文字与图表相结合的形式（凡用文字能说明的问题，就尽量不用图表在复述；不要同时用表和图重复同一数据）；

Automatica 138 (2022) 110156

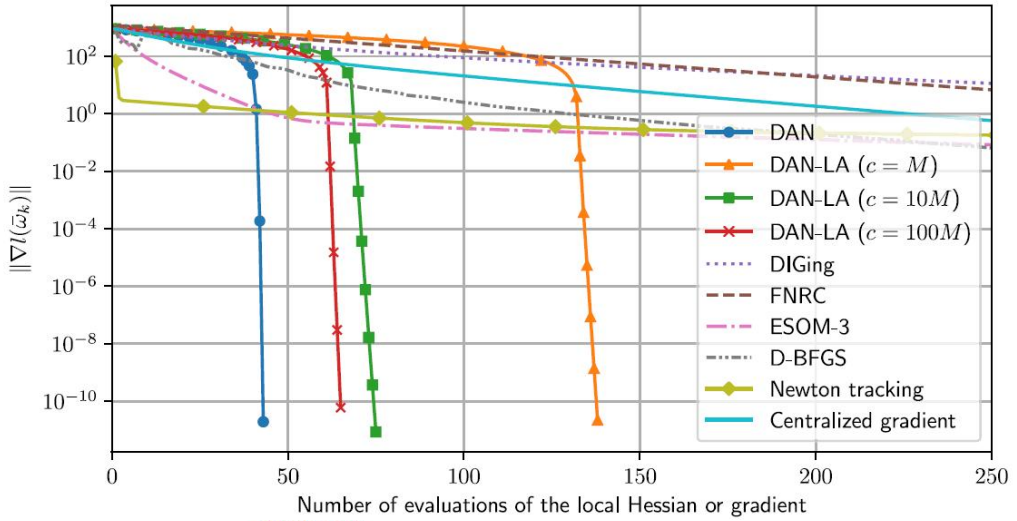


TABLE III

PERFORMANCE COMPARISON OF ALL THE COMPETING METHODS IN THE COMPLEX NOISE CASE ON THE ICVL DATA SET. THE BEST AND THE SECOND BEST RESULTS ARE BOLDFACED AND UNDERLINED, RESPECTIVELY

	Noisy HSI	LRMR [17]	LRTV [11]	TDL [14]	NGMeet [26]	NMoG [18]	E3DTV [41]	LRTDTV [22]	HSI-DeNet [27]	HSID-CNN [28]	Ours
						case 1					
PSNR	17.90	29.05	31.94	28.55	29.19	33.64	33.12	39.15	39.57	<u>39.60</u>	**40.28**
SSIM	0.145	0.529	0.867	0.470	0.572	0.788	0.883	0.948	0.971	<u>0.973</u>	**0.983**
SAM	1.008	0.516	<u>0.094</u>	0.528	0.582	0.098	0.179	0.217	0.110	0.114	**0.076**
						case 2					
PSNR	17.65	29.04	31.94	27.56	28.97	34.60	33.18	38.70	39.42	<u>39.61</u>	**40.58**
SSIM	0.138	0.530	0.867	0.442	0.566	0.807	0.885	0.945	0.970	<u>0.973</u>	**0.984**
SAM	1.007	0.515	0.100	0.538	0.584	<u>0.098</u>	0.296	0.213	0.115	0.117	**0.073**
						case 3					
PSNR	17.60	28.37	31.47	26.67	28.29	34.26	32.65	37.30	<u>38.76</u>	38.64	**40.24**
SSIM	0.139	0.516	0.867	0.431	0.564	0.821	0.885	0.933	<u>0.974</u>	0.972	**0.984**
SAM	1.024	0.535	0.119	0.569	0.605	0.117	0.233	0.212	<u>0.114</u>	0.119	**0.075**

六、结果

➢ 要点

- 对实验或观察结果的表达要高度概括和提炼（按逻辑顺序描述或总结重要的观察结果）；
- 数据表达可采用文字与图表相结合的形式（凡用文字能说明的问题，就尽量不用图表在复述；不要同时用表和图重复同一数据）；
- 尽可能列出结果的原始数据，而不能只报道统计处理后的数据（为帮助读者理解，可适当评论原始数据，对结果的说明、解释，与理论模型或他人结果的比较等）；

6. Numerical examples

In this section, we test DAN and DAN-LA by training a binary logistic regression classifier for the Covertype dataset from the UCI machine learning repository (Dheeru & Karra Taniskidou, 2017), where the samples in Classes 3 and 7 are used. The optimization problem involved has the following form:

$$\min.\ l(\omega) \triangleq -\sum_{i=1}^{m} y_i \ln \sigma(z_i) + (1-y_i)\ln(1-\sigma(z_i)) + \frac{\rho}{2}\|\omega\|^2$$

where $\omega \in \mathbb{R}^{55}$ and $m = 56264$ is the number of samples; $z_i = \omega^{\mathsf{T}}\mathbf{x}_i$ where $\mathbf{x}_i \in \mathbb{R}^{55}$ is the feature of the ith sample with each entry normalized to $[-1, 1]$, and $y_i \in \{0, 1\}$ is the corresponding label. The regularization parameter is chosen as $\rho = 0.01m$. The gradient and Hessian are respectively $\nabla l(\omega) = \sum_{i=1}^{m} \mathbf{x}_i(\sigma(z_i)-y_i)+r\omega$ and $\nabla^2 l(\omega) = \sum_{i=1}^{m} \mathbf{x}_i\mathbf{x}_i^{\mathsf{T}}\sigma(z_i)(1-\sigma(z_i))+rI$.

For distributed training, we randomly partition the dataset over $n = 10$ or $n = 100$ nodes with each one privately holding a local subset. We compare our algorithms with the four second-order methods: FNRC (Varagnolo et al., 2016), ESOM-3 (Mokhtari et al., 2016), Newton tracking (Zhang et al., 2021), D-BFGS (Eisen et al., 2017), and a first-order method: DIGing (Nedić et al., 2017). An undirected communication network is constructed by adopting the Erdős–Rényi model (Erdős & Rényi, 1960), i.e., each pair of nodes is connected with probability $2\ln n/n$. For comparison, the edge weights are generated by the Metropolis method (Nedić et al., 2017; Shi et al., 2015).

六、结果

➢ 要点

- 对实验或观察结果的表达要高度概括和提炼（按逻辑顺序描述或总结重要的观察结果）；
- 数据表达可采用文字与图表相结合的形式（凡用文字能说明的问题，就尽量不用图表在复述；不要同时用表和图重复同一数据）；
- 尽可能列出结果的原始数据，而不能只报道统计处理后的数据（为帮助读者理解，可适当评论原始数据，对结果的说明、解释，与理论模型或他人结果的比较等）；

Data + Figures + Tables !

6. Numerical examples

In this section, we test DAN and DAN-LA by training a binary logistic regression classifier for the Covertype dataset from the UCI machine learning repository (Dheeru & Karra Taniskidou, 2017), where the samples in Classes 3 and 7 are used. The optimization problem involved has the following form:

$$\min.\ l(\omega) \triangleq -\sum_{i=1}^{m} y_i \ln \sigma(z_i) + (1-y_i)\ln(1-\sigma(z_i)) + \frac{\rho}{2}\|\omega\|^2$$

where $\omega \in \mathbb{R}^{55}$ and $m = 56264$ is the number of samples; $z_i = \omega^{\mathsf{T}}\mathbf{x}_i$ where $\mathbf{x}_i \in \mathbb{R}^{55}$ is the feature of the ith sample with each entry normalized to $[-1, 1]$, and $y_i \in \{0, 1\}$ is the corresponding label. The regularization parameter is chosen as $\rho = 0.01m$. The gradient and Hessian are respectively $\nabla l(\omega) = \sum_{i=1}^{m} \mathbf{x}_i(\sigma(z_i)-y_i)+r\omega$ and $\nabla^2 l(\omega) = \sum_{i=1}^{m} \mathbf{x}_i\mathbf{x}_i^{\mathsf{T}}\sigma(z_i)(1-\sigma(z_i))+rI$.

For distributed training, we randomly partition the dataset over $n = 10$ or $n = 100$ nodes with each one privately holding a local subset. We compare our algorithms with the four second-order methods: FNRC (Varagnolo et al., 2016), ESOM-3 (Mokhtari et al., 2016), Newton tracking (Zhang et al., 2021), D-BFGS (Eisen et al., 2017), and a first-order method: DIGing (Nedić et al., 2017). An undirected communication network is constructed by adopting the Erdős–Rényi model (Erdős & Rényi, 1960), i.e., each pair of nodes is connected with probability $2\ln n/n$. For comparison, the edge weights are generated by the Metropolis method (Nedić et al., 2017; Shi et al., 2015).

六、结果

➢ 时态

- 现在时：对研究结果的说明或由其得出的一般性推论，不同结果之间的比较；

These results agree well with the findings of Smith…

- 过去时：所叙述结果的内容为关于过去的事实；

After flights of less than two hours, 11% of the army pilots and 33% of the civilian pilots reported back pain.

6.1.3. Summary on the numerical example

The comparison of detection rates for faults in both S_y and S_r is not included due to page limitation, which has a similar result to the case study in the next subsection.

For all nonzero fault magnitudes, fault detection rates also reflect missing alarm rates. Further, the detection rates for zero fault magnitude correspond to the false alarm rates. From Tables 3 and 4, it can be observed that the false alarm rates for three policies are nearly the same.

六、结果

➢ 讨论

- 重点在于对研究结果的解释和推断，并说明作者的结果是否支持或反对某种观点、是否提出了新的问题或观点等；
- 撰写讨论时要避免含蓄，尽量做到直接、明确，以便审稿人和读者了解论文为什么值得引起重视；

In summary, for both KPI-related and KPI-unrelated faults, KPI-KPLS provided correct KPIs information, whereas MKPLS gave wrong alarms. It is clear that KPI-KPLS is more effective because it covers accurate scenarios of KPIs, which are unavailable in industrial processes. From this point of view, the criterion in [34] and the criterion in this article can be used to analyze the T^2 statistic. The details are presented in Table VII, where n_y is the number of samples for which the statistics exceeded their thresholds, n_t is the number of all fault samples, $\surd$ represents that the listed inequality is satisfied, and $\times$ represents that the listed inequality is unsatisfied. From the criterion in [34], if $n_y/n_t > 10\%$, the fault would be a KPI-related fault; and if the window size $w \geq 10\%n_t$, the KPI-related fault would be a short-lived KPI-related fault. Applying these criteria, KPI-KPLS accurately categorized faults, whereas MKPLS gave wrong indications from Table VII.

六、结果

➢ 讨论什么内容

- 回顾研究的主要目的或假设，并探讨所得到的结果是否符合原来的期望？如果没有的话，为什么？
- 概述最重要的结果，并指出其能否支持先前的假设以及是否与其他学者的结果一致？如果不一致，为什么？
- 对结果提出说明、解释或猜测；根据这些结果，能得出何种结论或推论？
- 指出研究的局限性以及这些局限对研究结果的影响，并建议进一步的研究题目或方向；
- 指出结果的理论意义(支持或反驳相关领域中现有的结论，对现有理论的修正)和实际应用；

六、结果

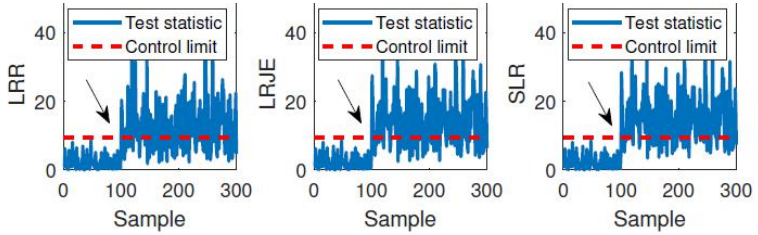


Fig. 2. Monitoring performance of T^2 test statistic for Case II.

it continuously. This suggests that minor faults and noise are difficult to detect. In contrast, the proposed SLR is able to obtain more samples that exceed the control limit, which indicates that its monitoring performance is better.

Case II simulates a step change that occurs in a hidden variable. Compared with Case I, the fault slightly affects SPE test statistic, but largely affects T^2 test statistic. Thus, only the monitoring results of T^2 test statistic are displayed in Fig. 2. It is concluded that Case II is more difficult to detect since all six methods fail to detect this fault at the 101st sample. Even so, the proposed SLR can detect more fault samples, which verifies that the proposed method is much more promising.

As shown in Fig. 10, fault scores from T^2 statistics in SJSPCA identified variables v_6, v_7, and v_8 as faulty as they are significantly greater than zero. Similar isolation results can be observed for SPE statistics. On the other hand, both the contribution plots of T^2 and SPE statistics successfully identified v_7, v_8 as faulty, however, it is difficult to identify v_6 as faulty, since the contribution of v_6 is small. Considering that v_6, v_7, v_8 are CO_2, CO, H_2 concentrations measured by the same device, also later findings confirmed that a fault occurs in the gas concentration measurement device, it can be concluded that fault-isolation results obtained by SJSPCA are correct.

Figs. 11 and 12 further present the aggregated fault scores using PCA and SJSPCA. These results confirmed the previous observation that SJSPCA-based approach successfully identified the three gas concentrations as faulty, whereas PCA-based contribution plot did not isolate v_6 as faulty.

六、结果

➢ 常用表达

- 在讨论中应选择适当的词汇来区分推测与事实；

prove，demonstrate等表示作者坚信观点的真实性；

show，indicate，found等表示作者对问题的答案有某些不确定性；

imply，suggest等表示推测；

can，will，should，probably，may，could，possibly等情态动词来表示论点的确定性程度；

六、结果

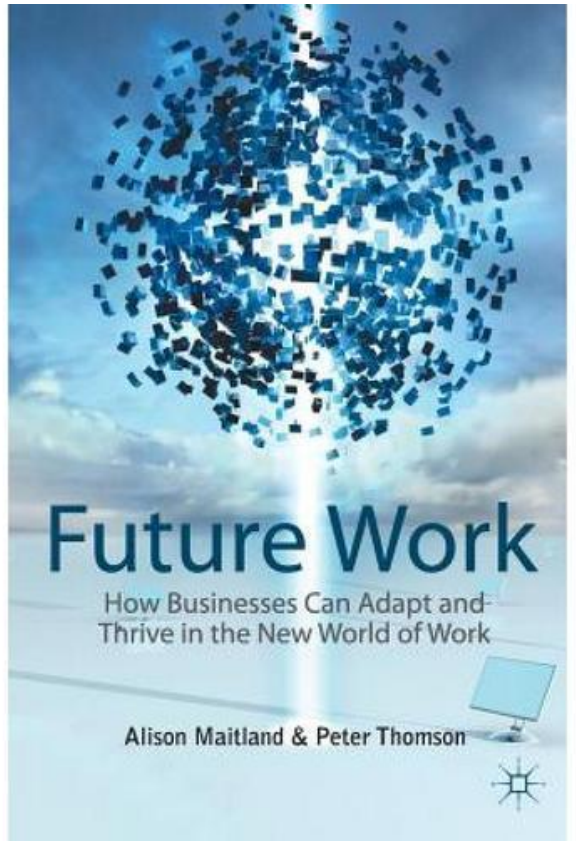
➢ 常用表达

- 建议新的题目或进一步研究方向时，常使用现在时动词，有时在动词前加情态动词would，could 或表示更强烈建议的should；

It would be interesting to learn why oxygen is depleted during this type of sputtering.

- 若提及自己正在进行或拟将进行的相关研究，用现在时或将来时，第一人称做主语；

In the future, we will investigate the effect of using an oxygen ambient.



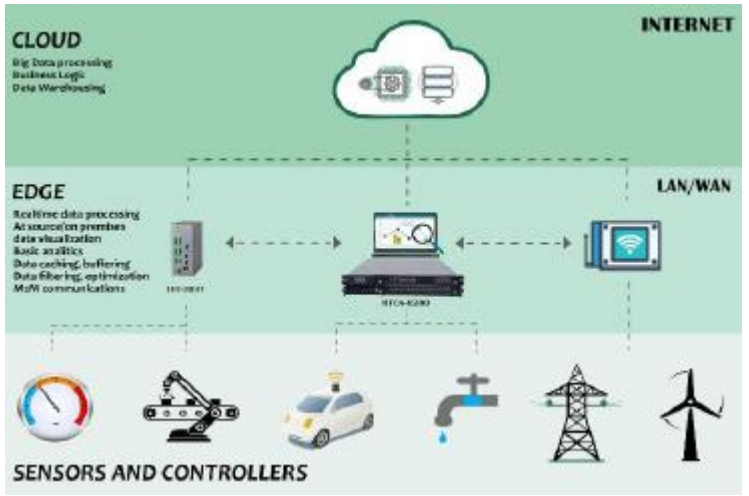
六、结果

➢ 常用表达

- 表达结果的理论意义或实际应用，多使用现在时，并辅以may，might或should（表示对自己研究的价值非常肯定）；

The results of this study may lead to the development of effective methods for teaching grammar to language immersion students.

The technique presented in this paper should be useful in reducing the amount of sludge in wastewater from semiconductor plants.



六、结果

➢ 例子

6. Discussions, generalizations and applications

6.1. Insights from Noether's theorem

The celebrated Noether's theorem (Neuenschwander, 2011) states that every differentiable symmetry of a group action on a physical system is associated with a corresponding conservation law. In special cases, two well-established conclusions on symmetry and conservation laws could be briefly stated as (i) symmetry under translations implies conservation of linear momentum, and (ii) symmetry under rotations implies conservation of angular momentum. In our definitions of the linear momentum and angular momentum for networked control systems, they are defined as *overall* quantities relating to the sum of individual momentum quantity over all agents. Thus, one can derive a multi-agent version of conservation laws in the light of Noether's theorem. We should emphasize that the *symmetry* in the context of distributed coordination control of networked systems comes from the following two aspects:

- The *invariance* of a predefined potential function under certain group actions, which enables one to calculate the *infinitesimal generator* corresponding to the group action along each agent's evolution;
- The *undirected* graph topology modelling the interactions between neighbouring agents, which allows one to adopt *gradient-based controllers* for a multi-agent coordination control problem (e.g., (5)).

We now show new proofs for generalizations of Theorems 1 and 2 in a much more general sense, with insights gained from the relation between symmetry and conservation laws. The main ideas are based on the fact that a shape potential function for formation control or coordination control, such as the one defined in (4), is invariant under translation/rotation group actions to all agents. The proofs also involve the calculation of infinitesimal generators of group actions associated with translations or rotations. We refer the readers to Bullo and Lewis (2004, Chapter 5.4) for several versions of theorem statements on *invariance under actions and infinitesimal generators*. In the following analysis, we assume that

$$\dot{p}_1 + \dot{p}_2 + \cdots + \dot{p}_n = 0 \tag{22}$$

and this proves the conservation of the overall linear momentum (or equivalently, the invariance of the formation centroid) for a coordination control system in the form $\dot{p} = -\nabla_p V$ derived from more general potential functions. □

It is clear that the formation potential function in (4) is invariant under translation action, and the gradient-based formation system can be derived from this potential under an undirected graph topology. The above proof also incorporates previous proofs reported in e.g. Garcia de Marina et al. (2016a), Krick et al. (2009), Oh & Ahn (2014) and Sun and Anderson et al., 2017) in a unified framework. We now show an alternative proof for a generalized Theorem 2 with the insight of rotation symmetry, by extending the results to more general potential functions.

Theorem 8 (*Conservation of Angular Momentum in General Distributed Coordination Systems*). *Consider a general potential function denoted by $V(p_1, p_2, \ldots, p_n)$ which is a function of relative vectors (i.e., $p_i - p_j$ with $(i, j) \in \mathcal{E}$) and is invariant under rotation action, and a distributed coordination system evolving as a gradient descent flow of V with an underlying undirected interaction graph. Then the angular momentum of the distributed coordination system is conserved and is zero.*

Proof. The invariance of V under rotation action implies that, for any $R \in SO(d)$ with $d = \{2, 3\}$,[2] there holds

$$\begin{aligned} V(p_1, p_2, \ldots, p_n) &= V(\bar{p}_1, \bar{p}_2, \ldots, \bar{p}_n) \\ &= V(R\bar{p}_1, R\bar{p}_2, \ldots, R\bar{p}_n). \end{aligned} \tag{23}$$

Note that any rotation matrix R can be written as $R = e^{\epsilon\hat{\omega}}$, where $\epsilon \in \mathbb{R}$ is a scalar parameter (e.g. angle of rotation), and $\hat{\omega} \in \mathfrak{so}(d)$ is a skew symmetric matrix. In the following we focus on the proof in the 3-D case, in which $\hat{\omega}$ can be obtained from a vector $\omega \in \mathbb{R}^3$ via the so-called *hat operator* (Murray, Li, & Sastry, 1994); i.e., for any $b \in \mathbb{R}^3$, there holds $\hat{\omega}b = \omega \wedge b$. The proof in the 2-D case follows similarly but can be simplified since $\hat{\omega} \in \mathfrak{so}(2)$ can be identified by a single parameter instead of a vector as in the 3-D case.

提纲

五 方法

六 结果

七 结论

七、结论

➢ 什么是结论？

- 论文的高度概括和理论总结，结论应该与论文的摘要、引言和论文的主体相呼应。结论要简明扼要，重点说明通过研究得到了什么结果，解决了什么问题，有待改进之处等。

IV. Conclusion and Future Work

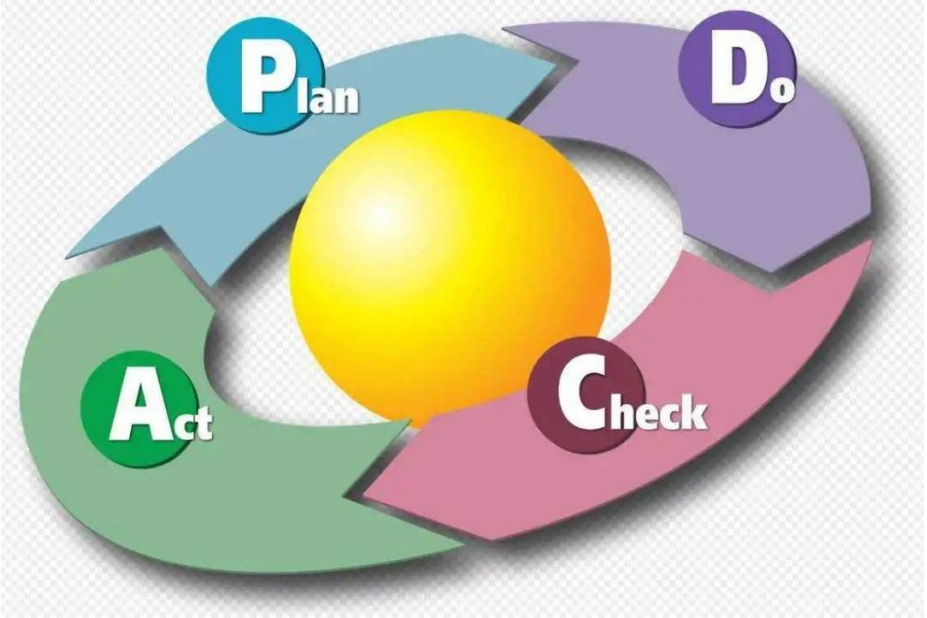
In this article, we have introduced a deep spatial-spectral global reasoning network for HSI denoising. To effectively and efficiently explore the contextual information for HSI denoising, we proposed two global reasoning modules to capture context along the spatial and channel dimensions, respectively. These two modules are further combined with densely connected networks and form the encoder and decoder, which can thus be used to exploit rich feature representations. The network formed by the encoder and decoder can preserve the image structures well while removing the complex noise. Experiments have verified the superiority of our method on both synthetic and real HSI data sets compared with other state-of-the-art HSI denoising methods.

Although the proposed network achieves excellent performance, the design of the network still lacks interpretation. In the future, we may focus on designing an interpretable network deduced from the traditional HSI denoising method (e.g., unfolding an iterative algorithm into a network), and thus each module of the proposed network has its own physical

七、结论

➢ Conclusion

- 论文的高度概括和理论总结，结论应该与论文的摘要、引言和论文的主体相呼应。结论要简明扼要，重点说明通过研究得到了什么结果，解决了什么问题，有待改进之处等。



结论是整个课题研究的总评价

结论中反映了论文的理论或技术方面的科学价值

Close the circle and move beyond.

七、结论

➢ 内容要点——创新与特色

- 本研究结果说明了什么问题，得出了什么规律性的东西，解决了什么理论或实际问题；

7. Conclusion

This paper has proposed two distributed second-order optimization algorithms with global superlinear convergence. The striking features lie in the use of (a) a finite-time set-consensus method, (b) an adaptive version of Newton method for global convergence, and (c) the low-rank matrix approximation methods to compress the Hessian for efficient communication. Future works can focus on asynchronous versions of the proposed algorithms as in Zhang and You (2019a, 2019b), the integration of the proposed algorithms with quasi-Newton methods, and developing more communication-efficient ones.

七、结论

➢ 内容要点——创新与特色

- 本研究结果说明了什么问题，得出了什么规律性的东西，解决了什么理论或实际问题；
- 对前人有关本问题的看法作了哪些检验，哪些与本研究结果一致，哪些不一致，作者做了哪些修正、补充、发展或否定；

7. Conclusions

PLS has been widely used for monitoring complex industrial processes when quality variables are taken into account. There is, however, a lack of understanding of PLS geometry for the purpose of process monitoring. In this paper, the effect of **Y** on the decomposition of the **X**-space is clearly shown and the geometric interpretation of the PLS decomposition structure is given. Based on this interpretation, two alternative algorithms of PLS, W-PLS and SIMPLS, are compared with the standard PLS in terms of the latent space decomposition and process monitoring. It is demonstrated that orthogonal sample space decomposition achieved by PLS is critical for process monitoring. It is concluded from analysis and simulation that monitoring using W-PLS and SIMPLS will cause ambiguous alarms and more missed alarms than the standard PLS. The standard PLS is the most appropriate for process monitoring among these alternative algorithms.

七、结论

➢ 内容要点——创新与特色

- 本研究结果说明了什么问题，得出了什么规律性的东西，解决了什么理论或实际问题；
- 对前人有关本问题的看法作了哪些检验，哪些与本研究结果一致，哪些不一致，作者做了哪些修正、补充、发展或否定；
- 本研究的不足之处或遗留问题。

IV. Conclusion

This paper proposed the framework for QFDD with application to batch multimode processes. The framework consists of three relevant methods: multimode clustering, a nonlinear fault diagnosis method, and online classification of the new measurement. The training data from different operating modes were clustered using the nonlinear KFCM-based method, and a BWP index was developed for determining the optimal mode number. The KPLS method was improved by considering a higher FDR, and based on it, the contribution rate method was used for fault diagnosis. The online data were classified using the abilities of KPLS regression and Bayes inference.

The proposed methods were applied to a batch HSMR process to diagnose faults that affect the product's thickness and flatness. It was seen that the framework can show accurate clustering results, higher detection, and precise diagnosis performance.

Future work considers topics with dynamics and non-Gaussian dataset in batch multimode processes to achieve optimal operating performance.

七、结论

➢ 内容要点——创新与特色

- 本研究结果说明了什么问题，得出了什么规律性的东西，解决了什么理论或实际问题；
- 对前人有关本问题的看法作了哪些检验，哪些与本研究结果一致，哪些不一致，作者做了哪些修正、补充、发展或否定；
- 本研究的不足之处或遗留问题。

- 研究了什么？
- 取得了什么结果？
- 还有哪些值得研究？

七、结论

➢ 内容要点——创新与特色

- 研究了什么？
- 取得了什么结果？
- 还有哪些值得研究？

In this paper, we have proposed and studied a novel spatiotemporal PCA framework, in which the spatial Laplacian is added to preserve the cause-effect relationship of process variables and the temporal Laplacian is added to maintain the geometric structure of process samples. Further, an efficient optimization algorithm based on sGS-ADMM has been developed and analyzed in detail. Numerical studies on the TE benchmark process have verified that the proposed framework can improve the monitoring ability and the proposed optimization algorithm is convergent. Naturally, the spatiotemporal prior can be combined with other data-driven PM approaches, which deserves further investigation.

七、结论

➢ 写作要求

◘ 概括准确，措词严谨

肯定和否定要明确，一般不用“大概”、“也许”、“可能是”这类词语，以免使人有似是而非的感觉，怀疑论文的真正价值。

VII. CONCLUSION

In this article, we proposed a novel feature selection approach, named unsupervised feature selection with RSOGFS, to solve the original $\ell_{2,0}$-norm constrained problem instead of solving its relaxed or approximate problem. RSOGFS directly selects a good feature subset rather than selecting good individuals one by one. Moreover, RSOGFS simultaneously performs feature selection and similarity matrix construction to adaptively learn the local manifold structure of data. Most importantly, two optimization strategies are derived to optimize the proposed RSOGFS model. We proved the convergence and approximation guarantees for the new algorithms. The superiority of RSOGFS over the state of the arts was demonstrated on real-world data sets.

七、结论

➢ 写作要求

□ 概括准确，措词严谨

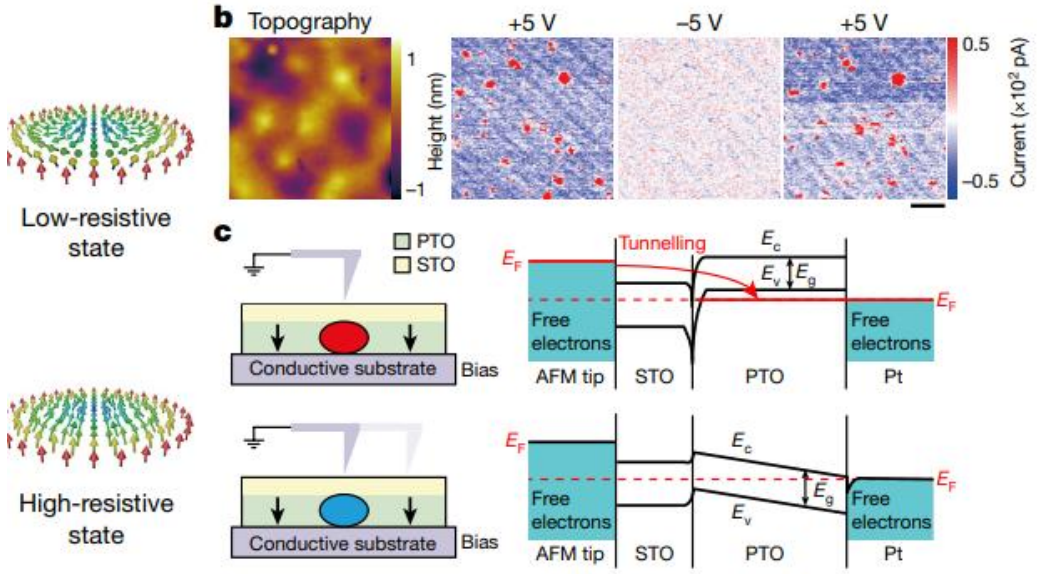
肯定和否定要明确，一般不用“大概”、“也许”、“可能是”这类词语，以免使人有似是而非的感觉，怀疑论文的真正价值。

□ 不作自我评价

不宜用如“本研究具有国际先进水平”、“本研究结果属国内首创”、“本研究结果填补了国内空白”一类语句来作自我评价。

Conclusion

In summary, we report the observation of two types (centre divergent and centre convergent) of skyrmion-like polar nanodomain in $PbTiO_3$/$SrTiO_3$ bilayers transferred onto silicon, which can be converted to each other by applying an external electric field. High-density resistive memories based on these topological nanodomains have been demonstrated and the ‘on’ and ‘off’ states can be controlled by switching the type of nanodomain. There are several unique advantages of this type of polar texture integrated on silicon. (1) As there is only a single layer



七、结论

➢ 常用语

- It is clear from the forgoing discussion that …
- This demonstration/illustration/comparison shows …
- The above results/data lead us to a conclusion that …
- From the results we have obtained/it can be concluded that …
- On the basis of these results we conclude that …
- All these data confirm the previous assumption that …
- It has been proved that the separation ratio of this system is superior to that of the conventional system.
- Studies and trials have led to the conclusion that digital voice transmission has substantial advantages over analog transmission and should thus be provided for

七、结论

➢ 常用语

- On the basis of …, the following conclusion can be drawn…
- From …, we now conclude …
- To sum up, we have revealed…
- We have demonstrated in this paper…
- The results of the experiment indicate…
- On conclusion, the result shows…
- We have described…, we found…
- The research work has brought about a discovery of …
- Finally, a summary is given of …
- These findings of the research have led the author to the conclusion that…

七、结论

➢ 例子

Conclusion

Our results comprehensively demonstrate that a pure reinforcement learning approach is fully feasible, even in the most challenging of domains: it is possible to train to superhuman level, without human examples or guidance, given no knowledge of the domain beyond basic rules. Furthermore, a pure reinforcement learning approach requires just a few more hours to train, and achieves much better asymptotic performance, compared to training on human expert data. Using this approach, AlphaGo Zero defeated the strongest previous versions of AlphaGo, which were trained from human data using handcrafted features, by a large margin.

Humankind has accumulated Go knowledge from millions of games played over thousands of years, collectively distilled into patterns, proverbs and books. In the space of a few days, starting *tabula rasa*, AlphaGo Zero was able to rediscover much of this Go knowledge, as well as novel strategies that provide new insights into the oldest of games.

七、结论

➢ 结果、讨论与结论的侧重

- 结　果：介绍研究结果(必要时应使用图表)；对重要研究结果的描述和说明；
- 讨　论：探讨所得到的结果与研究目的或假设的关系、与他人研究结果的比较与分析；对研究结果的解释(是否符合原来的期望)；重要研究结果的意义(推论)；研究展望；
- 结　论：主要认识或论点；概述研究成果可能的应用前景及局限性；建议需要进一步研究的课题或方向

提纲

八 致谢

九 文献

十 简历

八、致谢

➢ Acknowledgment

- 表示对本文有所帮助的人的感谢，而这些人又不适合作为作者署名
- 例如：

Significant technical help

Academic discussion

Financial support

Reviewers

ambiguous alarms and more missed alarms than the standard PLS. The standard PLS is the most appropriate for process monitoring among these alternative algorithms.

Acknowledgements

This work was supported by the national 973 projects under Grants 2010CB731800 and 2009CB32602, and NSFC under Grants 60721003 and 60736026, and the Changjiang Professorship (S. Joe Qin) by the Ministry of Education of PR China.

Appendix A. Proof of Lemma 1

According to Zhang (2004), the oblique projector onto Span(**H**) along Span(**S**) can be obtained by the following equation generally:

八、致谢

➢ Acknowledgment

Acknowledgments. The major part of this work was carried out during tl first author's postdoctoral stint in the Department of Mathematics at the Nation University of Singapore. We are grateful to the associate editor and anonymo referees for their valuable comments and suggestions that have helped to improve th paper.

ACKNOWLEDGMENTS

The research project is supported by the Australian Research Council (ARC) through the grant DP130100364. Ming Yin is supported by the Foundation of Key Laboratory of Autonomous Systems and Networked Control, Ministry of Education, P.R. China (No. 2013A06), and Guangdong Natural Science Foundation (No. 2014A030313511) also in part supported by National Natural Science Foundation (NSF) of China (grant nos. 61333013 and 61322306). Zhouchen Lin is supported by National Basic Research Program of China (973 Program) (grant no. 2015CB352502), National Natural Science Foundation (NSF) of China (grant nos. 61272341 and 61231002), and Microsoft Research Asia Collaborative Research Program. Zhouchen Lin is the corresponding author.

Acknowledgements The authors would like to thank Dr. Xudong Li and Ms. Meixia Lin for their help in the numerical implementations. We also thank the referees for their valuable suggestions which have helped to improve quality of this paper.

八、致谢

➢ Appendix

- 一些在正文中不宜出现的公式推导或定理证明，可以放在Appendix中，以使正文更加简明扼要。
- 通常在致谢后面，比如证明、说明、具体方案等等。

ambiguous alarms and more missed alarms than the standard PLS. The standard PLS is the most appropriate for process monitoring among these alternative algorithms.

Acknowledgements

This work was supported by the national 973 projects under Grants 2010CB731800 and 2009CB32602, and NSFC under Grants 60721003 and 60736026, and the Changjiang Professorship (S. Joe Qin) by the Ministry of Education of PR China.

Appendix A. Proof of Lemma 1

According to Zhang (2004), the oblique projector onto Span(**H**) along Span(**S**) can be obtained by the following equation generally:

八、致谢

➢ Appendix

- 不过正文必须提及附录及其作用。

ambiguous alarms and more missed alarms than the standard PLS. The standard PLS is the most appropriate for process monitoring among these alternative algorithms.

Acknowledgements

This work was supported by the national 973 projects under ants 2010CB731800 and 2009CB32602, and NSFC under Grants 721003 and 60736026, and the Changjiang Professorship (S. Joe ı) by the Ministry of Education of PR China.

Lemma 1. *Let* $\Pi_{P|R^\perp}$ *denote the projector onto the subspace* Span$\{\mathbf{P}\}$, *along the subspace* Span$\{\mathbf{R}\}^\perp$.

$$\Pi_{P|R^\perp} = \mathbf{P}\mathbf{R}^{\mathrm{T}}$$
$$\Pi_{R^\perp|P} = \mathbf{I} - \mathbf{P}\mathbf{R}^{\mathrm{T}}. \quad (15)$$

The proof is given in Appendix A.

pendix A. Proof of Lemma 1

According to Zhang (2004), the oblique projector onto Span($\mathbf{H}$) ıng Span($\mathbf{S}$) can be obtained by the following equation generally:

八、致谢

➢ 那些奇葩的致谢

Acknowledgments

This work was supported by the National Natural Science Foundation of China (Grant nos. 81470612 and 81670832). In addition, Jianghua Hu especially wishes to thank JJ Lin, whose songs have given her powerful spiritual support over the past decade.

八、致谢

➢ 那些奇葩的致谢

OPEN

Astragaloside IV ameliorates allergic inflammation by inhibiting key initiating factors in the initial stage of sensitization

Received: 20 July 2016
Accepted: 07 November 2016
Published: 05 December 2016

Kai-fan Bao[1,*], Xi Yu[1,*], Xiao Wei[1,†], Li-li Gui[1], Hai-liang Liu[1], Xiao-yu Wang[1], Yu Tao[2], Guo-rong Jiang[2] & Min Hong[1]

Acknowledgements

This work was funded by Projects 81073121, 81373549 and 81473395, supported by the National Natural Science Foundation of China, the Priority Academy Program Development of Jiangsu Higher Education Institutions, and the Natural Science Foundation of Jiangsu Province (BK20141466). KFB thanks the inimitable care and support of XY over the years. I love you. Will you spend the rest of your life with me?

八、致谢

➢ 那些奇葩的致谢


Contents lists available at ScienceDirect

Physica A

journal homepage: www.elsevier.com/locate/physa

Performance analysis for minimally nonlinear irreversible refrigerators at finite cooling power

Rui Long *, Zhichun Liu, Wei Liu *

School of Energy and Power Engineering, Huazhong University of Science and Technology, 1037 Luoyu Road, Wuhan 430074, China

Acknowledgments

We acknowledge the support received from the National Natural Science Foundation of China (51706076, 51736004). In addition, Rui Long wants to thank, in particular, the patience, care and support from Panpan Mao over the passed years. Will you marry me?

提纲

八 致谢

九 文献

十 简历

九、文献

➢ References

- 科技论文必备的部分，一般附在论文之后。参考文献要列出本文研究工作所参考的主要论文、著作或学位论文等，在本文的正文中要逐一引用。

References

Alcala, C., & Qin, S. (2009). Reconstruction-based contribution for process monitoring. *Automatica*, *45*(7), 1593–1600.

Chiang, L. H., Russell, E., & Braatz, R. D. (2001). *Fault detection and diagnosis in industrial systems*. London: Springer.

Choi, S. W., & Lee, I. B. (2005). Multiblock PLS-based localized process diagnosis. *Journal of Process Control*, *15*(3), 295–306.

Dayal, B. S., & MacGregor, J. F. (1997). Improved PLS algorithms. *Journal of Chemometrics*, *11*(1), 73–85.

De Jong, S. (1993). SIMPLS: An alternative approach to partial least squares regression. *Chemometrics and Intelligent Laboratory Systems*, *18*(3), 251–263.

Di Ruscio, D. (2000). A weighted view on the partial least-squares algorithm. *Automatica*, *36*(6), 831–850.

Downs, J. J., & Vogel, E. F. (1993). A plant-wide industrial process control problem. *Computers & Chemical Engineering*, *17*(3), 245–255.

Dunia, R., & Qin, S. J. (1998). Subspace approach to multidimensional fault identification and reconstruction. *AIChE Journal*, *44*(8), 1813–1831.

Helland, I. S. (1988). On the structure of partial least squares regression. *Communications in Statistics-Simulation and Computation*, *17*(2), 581–607.

Hóskuldsson, A. (1988). PLS regression methods. *Journal of Chemometrics*, *2*, 211–228.

Kresta, J. V., MacGregor, J. F., & Marlin, T. E. (1991). Multivariate statistical monitoring of process operating performance. *Canadian Journal of Chemical Engineering*, *69*(1), 35–47.

Lee, G., Han, C. H., & Yoon, E. S. (2004). Multiple-fault diagnosis of the Tennessee Eastman process based on system decomposition and dynamic PLS. *Industrial and Engineering Chemistry Research*, *43*(25), 8037–8048.

Lu, N., Gao, F., & Wang, F. (2004). Sub-PCA modeling and on-line monitoring strategy for batch processes. *AIChE Journal*, *50*(1), 255–259.

九、文献

- 期刊
  - 作者姓名
  - 文章标题
  - 杂志名称
  - 年卷(期)
  - 引用部分起止页码

九、文献

➢ 期刊

- 作者姓名
- 文章标题
- 杂志名称
- 年卷(期)
- 引用部分起止页码

IEEE Format

Y. Liu, J. Zeng, L. Xie, S. Luo, and H. Su, “Structured joint sparse principal component analysis for fault detection and isolation,” IEEE Trans. Ind. Informat., vol. 15, no. 5, pp. 2721–2731, May 2019.

European Forma

Y. Liu, J. Zeng, L. Xie, S. Luo, H. Su, Structured joint sparse principal component analysis for fault detection and isolation, IEEE Trans. Ind. Inf. 15 (5) (2018) 2721–2731.

九、文献

- 书写方式（数学常用，但工程少见）

```
\begin{thebibliography}{00}

\bibitem{ding2014data}
 S. Ding,
 ``Data-Driven Design of Fault Diagnosis and Fault-Tolerant Control Systems,''
 \emph{London, U.K.: Springer-Verlag}, 2014.


\bibitem{chen2021complex}
 X. Chen, J. Wang, and S. Ding,
 ``Complex system monitoring based on distributed least squares method,''
 \emph{IEEE Trans. Autom. Sci. Eng.}, vol. 18, no. 4, pp. 1892-1900, 2021.


\bibitem{li2021asynchronized}
 L. Li, S. Ding, Y. Na, and J. Qiu,
 ``An asynchronized observer based fault detection approach for uncertain switcl
 \emph{IEEE Trans. Circuits Syst. II, Exp. Briefs}, vol. 69, no. 2, pp. 514-518
```

九、文献

➢ 另一种书写方式

A review on recent development of spacecraft attitude fault tolerant control system

S Yin, B Xiao, SX Ding, D Zhou - IEEE Transactions on ..., 2016 - ieeexplore.ieee.org

Motivated by several accidents, attitude control of a spacecraft subject to faults/failures has gained considerable attention in a wider range of aerospace engineering and academic ...

☆ 保存 99 引用 被引用次数：230 相关文章

```
\bibliographystyle{IEEEtran}
\bibliography{IEEEabrv,mybibfile}
```


```
@article{yin2016review,
  title={A review on recent development of spacecraft attitude fault toler
  author={Yin, Shen and Xiao, Bing and Ding, Steven X and Zhou, Donghua},
  journal={IEEE Transactions on Industrial Electronics},
  volume={63},
  number={5},
  pages={3311--3320},
  year={2016},
  publisher={IEEE}
}
```

九、文献

➢ 注意事项1

Feature selection based on structured sparsity: A comprehensive study

J Gui, Z Sun, S Ji, D Tao, T Tan - IEEE transactions on neural ..., 2016 - ieeexplore.ieee.org

Feature selection (FS) is an important component of many pattern recognition tasks. In these tasks, one is often confronted with very high-dimensional data. FS algorithms are designed to identify the relevant feature subset from the original features, which can facilitate subsequent analysis, such as clustering and classification. Structured sparsity-inducing feature selection (SSFS) methods have been widely studied in the last few years, and a number of algorithms have been proposed. However, there is no comprehensive study ...

☆ 保存 99 引用 被引用次数：241 相关文章 所有 10 个版本

```
@article{gui2016feature,
  title={Feature selection based on structured sparsi
  author={Gui, Jie and Sun, Zhenan and Ji, Shuiwang a
  journal={IEEE transactions on neural networks and l
  volume={28},
  number={7},
  pages={1490--1507},
  year={2016},
  publisher={IEEE}
}
```

Published in: IEEE Transactions on Neural Netw

Volume: 28 , Issue: 7, July 2017)

Page(s): 1490 - 1507 **INSPEC**

Date of Publication: 22 April 2016 **DOI:** 10.

▸ **ISSN Information:** **Publish**

PubMed ID: 28287983

九、文献

➢ 注意事项2

References

[1] Frank PM. Analytical and qualitative model-based fault diagnosisca survey and some new results. Eur J control 1996;2(1):6–28.

[2] Ding SX. Model-based fault diagnosis techniques: design schemes, algorithms, and tools. Springer Science and Business Media; 2008.

[3] Chen J, Patton RJ. Robust model-based fault diagnosis for dynamic systems. Springer Science & Business Media; 2012.

[4] Ding SX. Data-driven design of fault diagnosis and fault-tolerant control systems. Springer; 2014.

[5] Qin SJ. Survey on data-driven industrial process monitoring and diagnosis. Annu Rev Control 2012;36(2):220–34.

[6] Yin S, Ding SX, Xie X, Luo H. A review on basic data-driven approaches for industrial process monitoring. IEEE Trans Ind Electron 2014;61(11):6418–28.

[7] Chen Z, Ding SX, Zhang K, Li Z, Hu Z. Canonical correlation analysis-based fault detection methods with application to alumina evaporation process. Control Eng Pract 2016;46(1):51–8.

[8] Chen Z, Zhang K, Ding SX. Improved canonical correlation analysis-based fault detection methods for industrial processes. J Process Control 2016;41(1):26–34.

[9] Hu Z, Chen Z, Gui W, Jiang B. Adaptive pca based fault diagnosis scheme in imperial smelting process. ISA Trans 2014;53(5):1446–55.

[10] Zhou D, Li G, Qin SJ. Total projection to latent structures for process monitoring. AIChE J 2010;56(1):168–78.

[11] Ding SX, Yin S, Peng K, Hao H. A novel scheme for key performance indicator prediction and diagnosis with application to an industrial hot strip mill. IEEE Trans Ind Inform 2013;9(4):2239–47.

[12] Zhang K, Hao H, Chen Z, Ding SX, Peng K. A comparison and evaluation of key

[17] X. Suo, Topics in high-dimensional statistical learning, Ph.D. thesis, Stanford University (2018).

[18] R. T. Rockafellar, Convex Analysis, Princeton University Press, 2015.

[19] S. Boyd, N. Parikh, E. Chu, B. Peleato, J. Eckstein, et al., Distributed optimization and statistical learning via the alternating direction method of multipliers, Foundations and Trends® in Machine Learning 3 (1) (2011) 1–122.

[20] M. R. Hestenes, Multiplier and gradient methods, Journal of Optimization Theory and Applications 4 (5) (1969) 303–320.

[21] M. J. D. Powell, A method for nonlinear constraints in minimization problems, Optimization (1969) 283–298.

[22] J. J. Moreau, Fonctions convexes duales et points proximaux dans un espace Hilbertien, Comptes rendus hebdomadaires des séances de l'Académie des sciences 255 (1961) 2897–2899.

[23] N. Parikh, S. Boyd, et al., Proximal algorithms, Foundations and Trends® in Optimization 1 (3) (2014) 127–239.

[24] D. L. Donoho, De-noising by soft-thresholding, IEEE Transactions on Information Theory 41 (3) (1995) 613–627.

[25] J.-J. Moreau, Proximité et dualité dans un espace Hilbertien, Bulletin de la Société mathématique de France 93 (1965) 273–299.

[26] X. Li, D. Sun, K.-C. Toh, A highly efficient semismooth Newton augmented Lagrangian method for solving Lasso problems, SIAM Journal on Optimization 28 (1) (2018) 433–458.

[27] G. H. Golub, C. F. Van Loan, Matrix Computations, Vol. 3, JHU press, 2012.

九、文献

➢ 注意事项3

REFERENCES

[1] Q. Sun and Z. Ge, "A survey on deep learning for data-driven soft sensors," *IEEE Trans. Ind. Informat.*, early access, Jan. 20, 2021, doi: 10.1109/TII.2021.3053128.

[2] Y. Jiang, S. Yin, J. Dong, and O. Kaynak, "A review on soft sensors for monitoring, control and optimization of industrial processes," *IEEE Sensors J.*, early access, Oct. 22, 2020 , doi: 10.1109/JSEN.2020.3033153.

[3] Z. Ge, Z. Song, and F. Gao, "Review of recent research on data-based process monitoring," *Ind. Eng. Chem. Res.*, vol. 52, no. 10, pp. 3543–3562, Mar. 2013.

[4] S. Yin, J. J. Rodriguez-Andina, and Y. Jiang, "Real-time monitoring and control of industrial cyberphysical systems: With integrated plant-wide monitoring and control framework," *IEEE Ind. Electron. Mag.*, vol. 13, no. 4, pp. 38–47, Dec. 2019.

[5] G. Chen and Z. Ge, "Hierarchical Bayesian network modeling framework for large-scale process monitoring and decision making," *IEEE Trans. Control Syst. Technol.*, vol. 28, no. 2, pp. 671–679, Mar. 2020.

九、文献

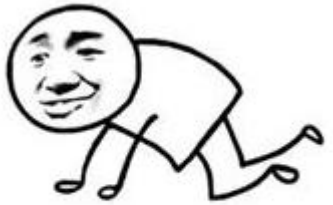
Second Order Approximation Solution of Nonlinear Large Deflection Problem of Yongjiang Railway Bridge in Ningbo

CHIEN Wei-zang

(*Shanghai Institute of Applied Mathematics and Mechanics, Shanghai University, Shanghai 200436, P.R. China*)

[参 考 文 献]

本文不必参考任何文献，文中有关小挠度的理论在一般的材料力学书中都能见到，有关非线性大挠度梁的基本微分方程及其近似解法，亦是首次在本文中提出。本人未见过宁波甬江大桥的设计，但曾到现场参观过，只是未曾听见有关技术人员具体解说过，有些江宽、高差和两端接不上的数据，只是目测估计的，如有不妥之处，还请谅解。



向大佬低头

提纲

十、简历

- Author’s biography
  - 不少杂志是不需要这一部分的，但世界上有些著名杂志要求在论文结束后还要有一个作者简介(甚至有的杂志还要印上作者的照片，如IEEE杂志)，所以作者本人应把这一简介的英文文本随同论文稿件一并寄上。

Francesco Bullo (S’95–M’99–SM’03–F’10) received the Laurea degree *(summa cum laude)* in electrical engineering from the University of Padova, Padua, Italy, in 1994, and the Ph.D. degree in control and dynamical systems from the California Institute of Technology, Pasadena, CA, USA, in 1999.

He is a Professor with the Mechanical Engineering Department, University of California at Santa Barbara, Santa Barbara, CA, USA. From 1998 to 2004, he was an Assistant Professor with the Coordinated Science Laboratory, University of Illinois at Urbana-Champaign. His main research interest is multi-agent networks with application to robotic coordination, distributed computing, and power networks. Other interests include vehicle routing, geometric control, and motion planning problems. He has published more than 200 papers in international journals, books and refereed conferences. He is the coauthor, with Andrew D. Lewis, of *Geometric Control of Mechanical Systems* (Springer, 2004) and, with Jorge Cortés and Sonia Martínez, of *Distributed Control of Robotic Networks* (Princeton Univ. Press, 2009).

Dr. Bullo has served or is serving on the Editorial Boards of the IEEE TRANSACTIONS ON AUTOMATIC CONTROL, the *ESAIM: Control, Optimization, and the Calculus of Variations*, and the *SIAM Journal of Control and Optimization*. His students’ papers were finalists for the Best Student Paper Award at the IEEE Conference on Decision and Control (2002, 2005, 2007), and the American Control Conference (2005, 2006, 2010).

十、简历

➢ 内容

- 自大学起获得的学位名称、时间、专业和学校及其地点。(也有个别人在开头一句话写上自己的出生年月日和出生地。)
- 工作经历(包括时间、职责、工作单位和地点)。
- 目前工作的侧重点或科研的兴趣及方向。
- 突出的论文和著作、科研成果、重点工程及获奖情况等。如果是著名学会的会员，则也要写上。

十、简历

➢ 要点

- 自大学起获得的学位名称、时间、专业和学校及其地点。(也有个别人在开头一句话写上自己的出生年月日和出生地。)
- 工作经历(包括时间、职责及工作单位和地点)。
- 目前工作的侧重点或科研的兴趣及方向。
- ~~突出的论文和著作、科研成果、重点工程及获奖情况等。如果是著名学会的会员，则也要写上。~~

XXX received the B. Eng. Degree in electrical engineering from Tianjin University, Tianjin, China, and the M. A. Sc. Degree in electrical engineering from University of Toronto, Toronto, Ont., Canada, in 2012 and 2015, respectively. Since 2016, he has been working toward the Ph.D Degree in electrical engineering at the University of Calgary, Calgary, Alta., Canada. His current research interests include switched-capacitor networks, three-dimensional digital image processing, one- and multi-dimensional digital

十、简历

➢ 学位名称

- B. S. (B. Sc.) 理学士
- B. A. 文学士
- B. Eng . 工学士
- M. S. 理硕士
- M. A . 文硕士
- M. Eng. 工硕士
- Ph. D 博士
- Doctor of Engineering 工程博士

十、简历

➢ 常用语

◘ 用于学历方面的句型

从XXXX年至XXXX年在XX大学学习XX专业

He attended … University from 1996 to 2000, majoring (or specializing) in …

◘ 用于获得学位的句型

在XXXX年在XX(地方的)XX大学XX系获得了XX学位。

In 2000, he received (obtained / earned / was awarded) a (an / the / his) … degree in …from…Department at …University, …(city, state or province, country).

十、简历

➢ 常用语

□ 用于表述科研方向的句型

His research interests (work) focus on (concentrate on / are in) the area(s) (field(s)) of …

He is actively (has been) engaged in (research in the area(s) of) …

He is active in (the area(s) of) …

□ 用于科研成果及获奖方面的句型

He invented (has made contributions specifically in) …

He received the medal (award) of …

He was awarded …

published

十、简历

➢ 常用语

◘ 用于工作经历的句型

在XX(单位)当XX

He works (acts / serves) as … at (in / for) …

是XX大学XX系XX专业的副教授

He is (an) associate professor of… in…Department at …University.

在XX大学攻读XX专业博士学位

He has been working (is (currently / presently) working) towards (on) the Ph.D. degree in …at …University.

十、简历

➢ 例子

Key-Performance-Indicator-Related Process Monitoring Based on Improved Kernel Partial Least Squares

Yabin Si, Youqing Wang, *Senior Member, IEEE*, and Donghua Zhou, *Fellow, IEEE*

Yabin Si received the B.S. degree in automation, in 2017, from the Beijing University of Chemical Technology, Beijing, China, where he is currently working toward the M.S. degree in control engineering.

His research interests include process monitoring based on principal component analysis and partial least squares.

十、简历

➢ 例子

Youqing Wang (Senior Member, IEEE) received the B.S. degree from Shandong University, Jinan, China, in 2003, and the Ph.D. degree in control science and engineering from Tsinghua University, Beijing, China, in 2008.

He is currently a Professor with the Shandong University of Science and Technology, Qingdao, China, and also with the Beijing University of Chemical Technology, Beijing, China. His research interests include fault-tolerant control, state monitoring, modeling and control of biomedical processes, and iterative learning control.

Dr. Wang is an (Associate) Editor for the IEEE ACCESS, *Multidimensional Systems and Signal Processing*, and *Canadian Journal of Chemical Engineering*. He holds membership of two IFAC Technical Committees (TC6.1 and TC8.2). He is a recipient of several research awards (including Journal of Process Control Survey Paper Prize and ADCHEM2015 Young Author Prize).

十、简历

➢ 例子

Donghua Zhou (Fellow, IEEE) received the B.Eng., M.Sci., and Ph.D. degrees in electrical engineering from Shanghai Jiao Tong University, Shanghai, China, in 1985, 1988, and 1990, respectively.

He was an Alexander von Humboldt Research Fellow with the University of Duisburg, Duisburg, Germany, from 1995 to 1996, and a Visiting Scholar with Yale University, New Haven, CT, USA, from 2001 to 2002. In 1996, he joined Tsinghua University, Beijing, China, and was promoted as a Full Professor in 1997. From 2008 to 2015, he was the Head of the Department of Automation, Tsinghua University. He is currently the Vice President of Shandong University of Science and Technology, Qingdao, China.

Dr. Zhou is a member of IFAC Technical Committee (TC) on Fault Detection, Supervision and Safety of Technical Processes (SAFEPROCESS), an Associate Editor of the *Journal of Process Control*, the Vice Chairman of the Chinese Association of Automation (CAA), the TC Chair of the SAFEPROCESS Committee, CAA. He was also the NOC Chair of the 6th IFAC Symposium on SAFEPROCESS, in 2006.

其他

➢ 科技写作中易忽视的字母该大写的场合

- 图表、定理、章节、参考文献等有表示顺序的号码时，如：

Fig.1 (Figure 1), Table 2, Theorem 3, Problem 4, Reference [5], Chapter 6, Section 7…

- 文章中提到带有学位、学衔的人时，其称呼的首字母要大写

The authors would like to acknowledge the excellent review of the entire manuscript by Dr. Edward Nelson.

I am indebted to Professors Glen Goff, W. W. Peterson, M. A. Miller, Robert Carroll, Irving Reed, and Irwin Lebow for their suggestions.

其他

➢ 英汉表达不一致的地方

- 主语不一致

这台计算机有毛病

Something is wrong with this computer.

其他

➢ 英汉表达不一致的地方

- 从句中代词使用位置不同

金属受热（它们）就会膨胀

Metals expand when (they are) heated.

其他

➢ 英汉表达不一致的地方

- 比较对象表达上的不一致

铜的导电率比铝高

The conductivity of copper is higher than that of aluminum.

Q & A