

INTRODUCTION OF



— 黄思琪 & 李谨杰 —

2022年4月25日



Organize

How to organize all the items in Zotero.



Notes

How to take notes in Zotero.



Cite

How to cite papers through Zotero.



Plugins

Several useful plugins for Zotero.



Collaborate

How to collaborate through Zotero.



Organization

Notes

Citation

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Collaboration

/ Collections and Tags

The screenshot displays the Zotero desktop application interface. On the left, a sidebar shows 'My Library' and various collections like 'Colonial Medicine', 'Teaching', and 'Group Libraries'. A red box highlights the 'My Library' icon. In the center, a main window lists items under a collection named 'Circulation of Medicine in the Early Modern Atlantic World'. A red box highlights the '+' button at the top of this list. Below the list, a 'To Read' section contains a large number of tags related to medicine and history. On the right, a detailed view of a journal article record is shown, with a sidebar listing various document types and a bottom panel showing metadata like type, title, author, and abstract.

To Read

- 19th century
- Acclimatization
- Aged
- Appetite
- Blood
- Cemetery
- Children
- Climate
- Colonies
- Competition
- Creoles
- Crossing
- Degeneration
- Diet
- Digestion
- Disease
- Doctors
- Drugs
- Electric
- Eels
- Empiricism
- Expertise
- Food
- France
- Geography
- Global
- Guyane
- Hair
- Indies
- Indigenous medicine
- Intemperance
- Language
- Lemonade
- Medicine
- Mortality
- Piment
- Poison
- Practice
- Professionalism
- Regeneration
- Secrets

Zotero Collection View

Collection: Colonial Medicine

Items:

- Guerre, maladie, empire. Les services de santé militaires en
- Officiers de santé et soignantes créoles face à la fièvre jaune
- The Emergence of Tropical Medicine in France
- Colonial Disease, Translation, and Enlightenment: Franco-British
- Trading in Drugs through Philadelphia in the Eighteenth Centur
- The Medicines Trade in the Portuguese Atlantic World: Acqui
- Leprosy and Slavery in Suriname: Godfried Schilling and the P
- Medical Experimentation and Race in the Eighteenth-century
- The Circulation of Bodily Knowledge in the Seventeenth-centur
- Circulation of Medicine in the Early Modern Atlantic World**
- Synthesis of scholarship on "medicines" to restore focus on
- Full Text PDF
- Colonial Medical Encounters in the Nineteenth Century: The R
- Networks in Tropical Medicine: Internationalism, Colonialism,
- Early Clinical Features of Dengue Virus Infection in Nicaragua
- Medicine in an age of commerce and empire: Britain and its tr
- Finding the "Ideal Diet": Nutrition, Culture, and Dietary Practi
- Battles of the Self: War and Subjectivity in Early Modern Fran
- The Experiments of Ramón M. Termeyer SJ on the Electric Eel
- Psychiatry and Empire
- Medicine and the Market in England and Its Colonies, C.1450-
- Matters of exchange: commerce, medicine, and science in the
- A Horrible Tragedy in the French Atlantic
- "Neither of meate nor drinke, but what the Doctor alloweth":
- Transnationalism in the colonies: Cooperation, rivalry, and rac
- Variolation, Vaccination and Popular Resistance in Early Col
- "Syphilis, Opiomania, and Pederasty": Colonial Constructions
- Choosing Scientific Patrimony: Sir Ronald Ross, Alphonse Lav
- Madness and Colonization: Psychiatry in the British and French
- The Colonial Machine: French Science and Colonization in the
- From medical astrology to medical astronomy: sol-lunar and p
- Disease and Empire: The Health of European Troops in the Co
- Climates & Constitutions: Health, Disease, Environment and P

Zotero Item Details

Type: Journal Article
Title: Circulation of Medicine in the Early Modern Atlantic World
Author: Cook, Harold J.
Author: Walker, Timothy D.
Abstract: The search for powerful drugs has caused people and commodities to move around the globe for many centuries, as it still does...
Volume: 26
Issue: 3
Pages: 337-351
Date: 2013/08/01
Series: Social History of Medicine
Volume Title: Social History of Medicine
Text: Soc Hist Med
Abbr: SHM
Language: en
DOI: 10.1093/shm/hkt013
ISSN: 0951-631X
Title: URL: https://academic.oup.com/shm/article/26/3...
Entered: 1/24/2018, 10:17:12 AM
Archive: 1/24/2018, 10:17:12 AM
Archive: 1/24/2018, 10:17:12 AM
Catalog: 1/24/2018, 10:17:12 AM
Number: 1/24/2018, 10:17:12 AM
Rights: 1/24/2018, 10:17:12 AM
Extra: 1/24/2018, 10:17:12 AM
Added: 1/24/2018, 10:17:12 AM
Modified: 1/24/2018, 11:50:15 AM



Organization

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/ Web page

做个示范

The screenshot shows a web browser displaying a research paper titled "Code tracking performance analysis of GNSS signal in the presence of CW interference" from the journal "Signal Processing". The paper is dated April 2011, has 30 citations, and 29 references. The abstract discusses the impact of continuous wave (CW) interference on GNSS receiver performance. On the right side of the browser window, the Zotero interface is visible, showing the paper being saved to a folder named "06 GNSS系统内系统间" under "我的文库". A red box highlights this process.

Code tracking performance analysis of GNSS signal in the presence of CW interference

April 2011 · Signal Processing 91(4):970-987 · [Follow journal](#)

DOI: [10.1016/j.sigpro.2010.09.022](https://doi.org/10.1016/j.sigpro.2010.09.022)

Source · [DBLP](#)

Yuqi Liu · Yihang Ran · Ting Ke · Xiulin Hu

Overview Stats Comments Citations (30) References (29) ... Request full-text Share

Abstract

Continuous wave (CW) interference can cause severe performance degradation of global navigation satellite system (GNSS) receiver. In analysing the code tracking performance of pilot channel under CW interference, the signal spectrum consists of discrete spectral lines and the interference term of the correlator output shows the characteristics of direct current or sine. Thus the traditional assumptions that the interference obeys the Gaussian distribution and that the spectrum of the signal is continuous no longer hold. Considering this fact, this paper presents the analytic expressions of the code tracking error bound for the early-minus-late power (EMLP) discriminator and the dot-product (DP) discriminator. The derived expressions can be used to assess the susceptibility of code tracking performance under CW interference for the pilot channel of GNSS signals. Then the GPS L5 signal is taken as an example

Recommend Recommend this work Follow Get updates Share Share in a message

保存到 06 GNSS系统内系统间

我的文库

干扰&兼容性

信号对GNSS的干扰

06 GNSS系统内系统间

07 C 测绘

GNSS

Code tracking performance analysis of GNSS s...
ResearchGate Link

WILEY Wiley

Call For Papers (Special Issue): Modeling, operation and management of traffic mixed with connected and automated vehicles

Call for papers

IET Intelligent Transport Systems.

Submission Deadline: 31/12/2023



Organization



Notes



Citation



Plugins



Collaboration

/ Take notes

The screenshot shows the Zotero application window with a note titled "Complex signum 非线性变换". The note content discusses interference cancellation (IC) and robust signal processing concepts. A red box highlights the "Notes" tab in the top right corner of the interface.

Complex signum 非线性变换

干扰消除interference cancellation (IC)是一种常见的抑制策略：

干扰检测；估计参数，基于参数模型重建干扰波型；PB和NF都属于这种策略

现有方案的局限性：

需要进行干扰检测，干扰检测中判定阈值的调整；

需要估计以及跟踪干扰信号（进行参数建模），当其快速运动时跟踪困难；

高端解决方案（例如天线阵列技术）并不总是能满足尺寸、重量和功率要求。

提出采用稳健（鲁棒）统计的概念进行信号处理：

使用零记忆非线性（ZNL）技术，普遍化了相关性并实现干扰消除（干扰会造成相关性的退化），该技术不需要设置检测阈值，也不需要估计干扰信号的参数；

提出了一种基于松弛经典高斯假设并考虑拉普拉斯分布测量的鲁棒GNSS接收机，允许离群值拒绝；

在GNSS接收机框架内引入稳健统计概念；

理论上评估在无干扰情况下复sgum非线性的影响，证明复sgum非线性不引入偏差(即，输出样本的平均值与输入样本的平均值成正比)；

给出了效率损失(即无干扰时噪声方差的相对增加)的封闭表达式。这种损失是由标称情况下的次最优性造成的。结果表明，这种非线性引起的损耗约为1.05 dB。

M-估计：ML(MAXIMUM LIKELIHOOD TYPE ESTIMATES)

主要思想：代价函数中的平方应该被残差增长速度较慢的函数所取代；

条件：存在大量不受干扰影响的样本（e.g.脉冲）干扰项BB[n]必须表现为离群值，并且必须有足够数量的干净样本来评估；

使用厚尾分布，将更大的概率分配给离群值，更好地描述噪声和干扰信号的联合PDF；

结果：C/N0

相对于不做任何抑制，本方法大大提高C/N0；

与PB差不多，本方法会带来约0.5dB的增益，PB是0；

两者的计算复杂度也差不多，但是本方法不依赖于任何参数。



Organization



Notes



Citation



Plugins



Collaboration

/ Citation in Word

The screenshot shows a Microsoft Word document titled "新建 DOCX 文档 - Word". The ribbon menu is visible at the top, and the Zotero ribbon tab is selected. The main content area displays a bibliography list:

标题	创建者	添加日期
Complex signum non-linearity for robust GNSS interference mitigation	Daniele 和 Pau Wang 等。	2022/4/8 上午9:33:35
Machine learning-based approach to GPS antijamming		2022/3/4 上午9:57:32

Below the table, four references are listed:

- (1) Daniele, B.; Pau, C. Complex Signum Non-linearity for Robust GNSS Interference Mitigation. *IET Radar, Sonar & Navigation* **2018**, *12* (8), 900–909. <https://doi.org/10.1049/iet-rsn.2017.0552>.
- (2) Borio, D. Myriad Non-linearity for GNSS Robust Signal Processing. *IET Radar, Sonar & Navigation* **2017**, *11* (10), 1467–1476. <https://doi.org/10.1049/iet-rsn.2016.0610>.
- (3) Wang, C.-Z.; Kong, L.-W.; Jiang, J.; Lai, Y.-C. Machine Learning-Based Approach to GPS Antijamming. *GPS Solut* **2021**, *25* (3), 115. <https://doi.org/10.1007/s10291-021-01154-7>.
- (4) Arce, G. R. *Nonlinear Signal Processing: A Statistical Approach*; Wiley-Interscience: Hoboken, N.J, 2005.

Page number 1 is visible at the bottom left, and page 6 is visible at the bottom right.



Organization



Notes



Citation



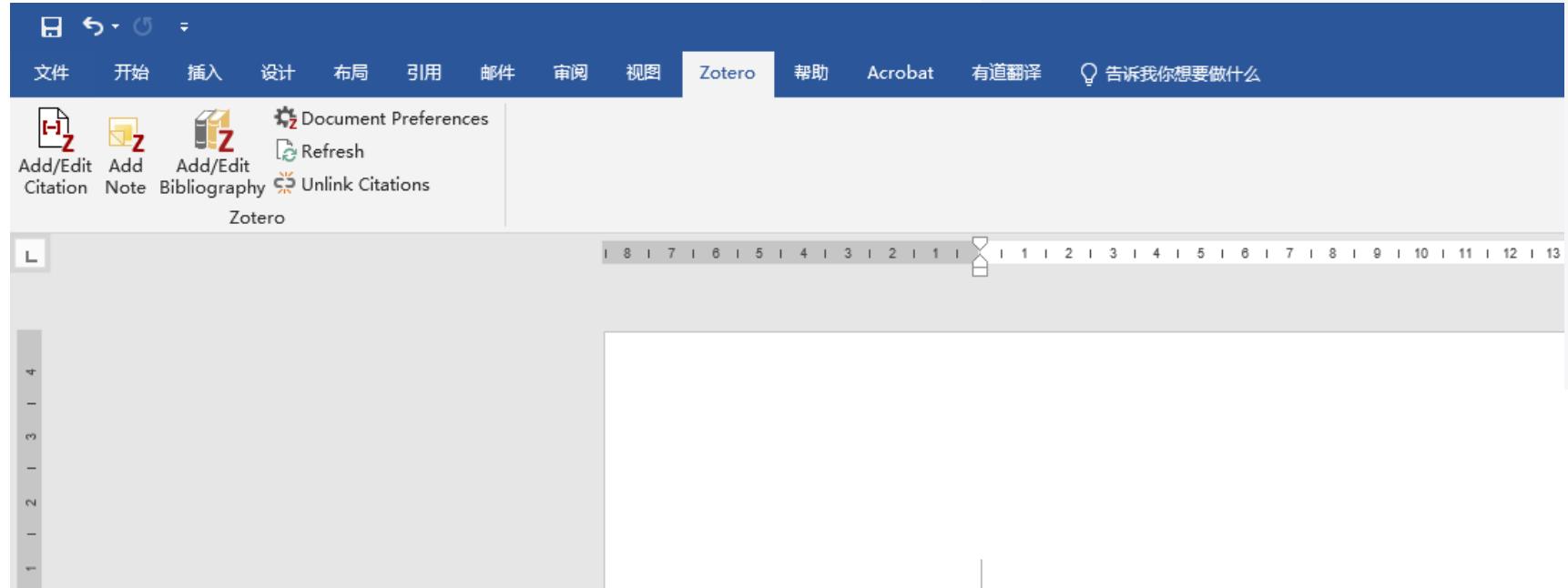
Plugins



Collaboration

/ Citation in Word

北航论文: GB7714-87



添加/编辑引文		在光标位置添加新引文或编辑文档中的现有引文。
添加/编辑参考书目		在光标位置插入参考书目或编辑现有的参考书目。
文档首选项		打开“文档首选项”窗口，例如更改引文样式。
刷新		刷新所有引文和参考书目，更新Zotero库中已更改的任何项目元数据。
取消链接引文		通过删除字段代码取消链接文档中的Zotero引用。这可以防止引用和参考书目的任何进一步的自动更新。 请注意，删除字段代码是不可逆转的，通常只能在文档的最终副本中完成。



Organization



Notes



Citation



Plugins



Collaboration

/ Citation in LaTeX



Better BibTeX for Zotero
Make Zotero useful for us LaTeX hol... More

Disable Remove

Title	Creator	Year	Info	Notes	Tags	Related
> Near-Optimal Area-Coverage Path Planning of Energy-Constrained Aerial Robots With Application	Jensen-Nau et al.	2021	1			
> Message-Aware Graph Attention Networks for Large-Scale Multi-Robot Path Planning	Li et al.	2021	2			
> Data-Driven MPC for Quadrotors	Torrente et al.	2021	2			
> A Real-Time Game Theoretic Planner for Autonomous Two-Player Drone Racing	Spica et al.	2020	3			
> Graph Neural Networks for Decentralized Multi-Robot Path Planning	Li et al.	2020	3			
> Mobile Robot Path Planning in Dynamic Environments through Globally Guided Reinforcement Learning	Wang et al.	2020	3			
> The Emergence of Adversarial Communication in Multi-Agent Reinforcement Learning	Blumenkamp and Prorok	2020	1			
> Dynamic obstacle avoidance for quadrotors with event cameras	Falanga et al.	2020	1			
> Path planning techniques for unmanned aerial vehicles: A review, solutions, and challenges	Aggarwal and Kumar	2020	1			
> Methods for Online UAV Path Planning for Tracking Multiple Objects	Nguyen	2020	1			
> Minimal navigation solution for a swarm of tiny flying robots to explore an unknown environment	McGuire et al.	2019	1			
> Search-Based Motion Planning for Aggressive Flight in SE(3)	Liu et al.	2018	1			
> Tracking wildlife with multiple UAVs: System design, safety and field experiments	Bayram et al.	2017	1			
> A Survey of Motion Planning and Control Techniques for Self-Driving Urban Vehicles	Paden et al.	2016	1			
> Conflict-based search for optimal multi-agent pathfinding	Sharon et al.	2015	2			
> Path Planning and Trajectory Planning Algorithms: A General Overview	Gasparesotto et al.	2015	1			
> Quadrotor Helicopter Trajectory Tracking Control	Hoffmann et al.	2008	1			
> Reciprocal velocity obstacles for real-time multi-agent navigation	Van den Berg et al.	2008	1			
> Efficient Two-phase 3D Motion Planning for Small Fixed-wing UAVs	Hwangbo et al.	2007	1			
> Behaviour-based control: examples from navigation, learning, and group behaviour	Mataric	1997	1			

Citation Key: wang_mobile_2020

Item Type Journal Article
Title Mobile Robot Path Planning in Dynamic Environments through Globally Guided Reinforcement Learning
Author Wang, Binyu
Author Liu, Zhe
Author Li, Qingbiao
Author Prorok, Amanda
Abstract Path planning for mobile r...
Publication arXiv:2005.05420 [cs]
Volume
Issue
Pages
Date 2020-09-11 y m d
Series
Series Title
Series Text
Journal Abbr
Language



Organization



Notes



Citation

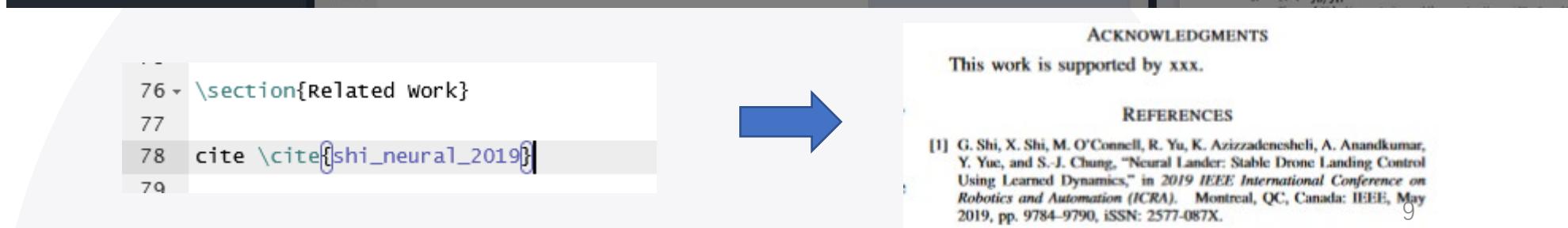
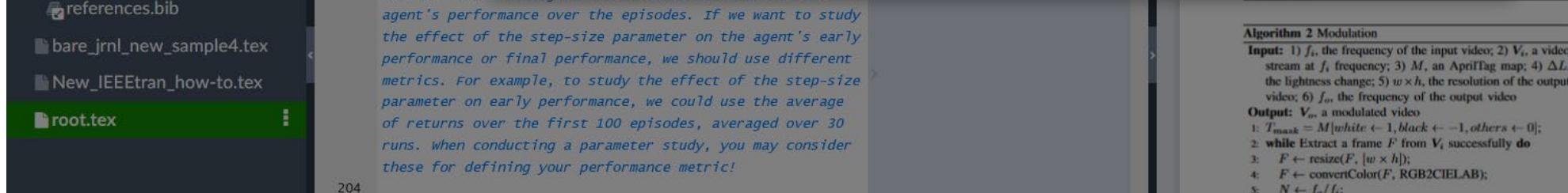
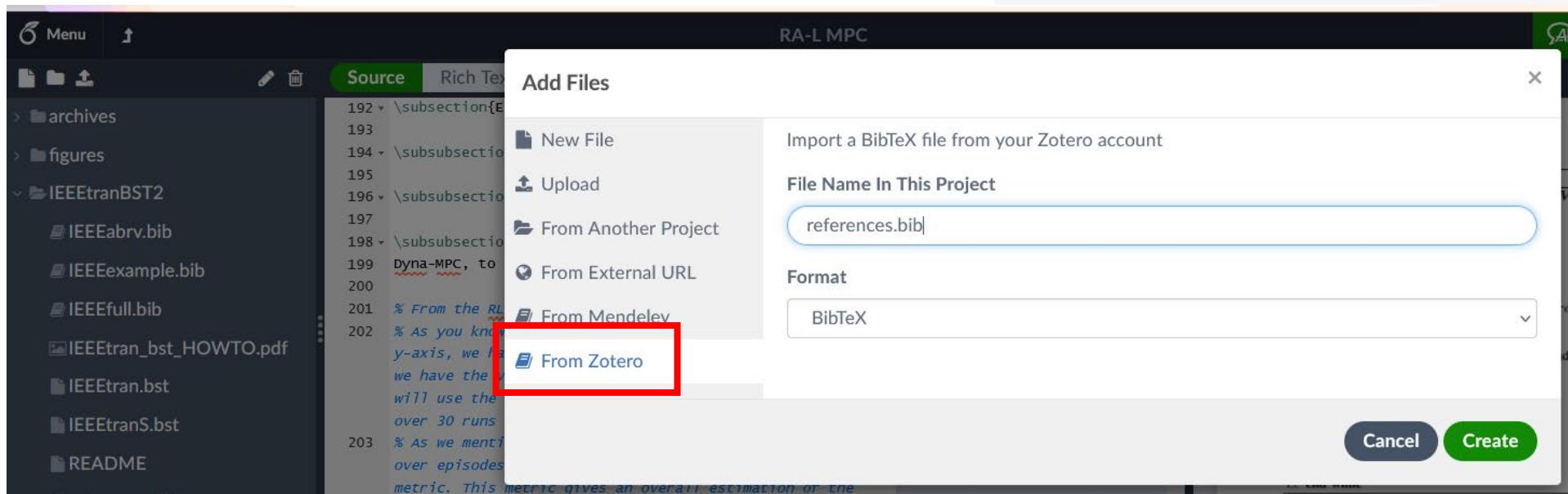


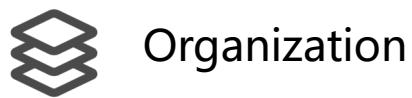
Plugins



Collaboration

/ Citation in LaTeX





/ Zotfile



ZotFile

Advanced PDF management for Zotero

- Manage your attachments: automatically rename, move, and attach PDFs (or other files) to Zotero items.

The screenshot shows two windows related to ZotFile. On the left is the 'ZotFile Preferences' dialog box, which has tabs for General Settings, Tablet Settings, Renaming Rules, and Advanced Settings. The General Settings tab is selected, showing options for attaching new files from a source folder and specifying a custom location for attachments. A 'Choose...' button is present for both fields. Below these fields is a section for 'Location of Files' where a radio button is selected for 'Custom Location' with the path 'D:\ZoteroBackup' entered. Another checkbox 'Use subfolder defined by /%y/%t' is checked. At the bottom of the dialog are 'OK' and 'Cancel' buttons. On the right is a Windows File Explorer window showing a folder named 'ZoteroBackup' containing numerous PDF files, each with a yellow thumbnail icon. The files are listed in chronological order, ranging from 1983 to 2022. The columns in the file list are '名称' (Name), '状态' (Status), '修改日期' (Last modified), '类型' (Type), and '大小' (Size). The status column contains green checkmarks, and the type column shows '文件夹' (Folder) for most entries.



Organization

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Citation

Plugins

Collaboration

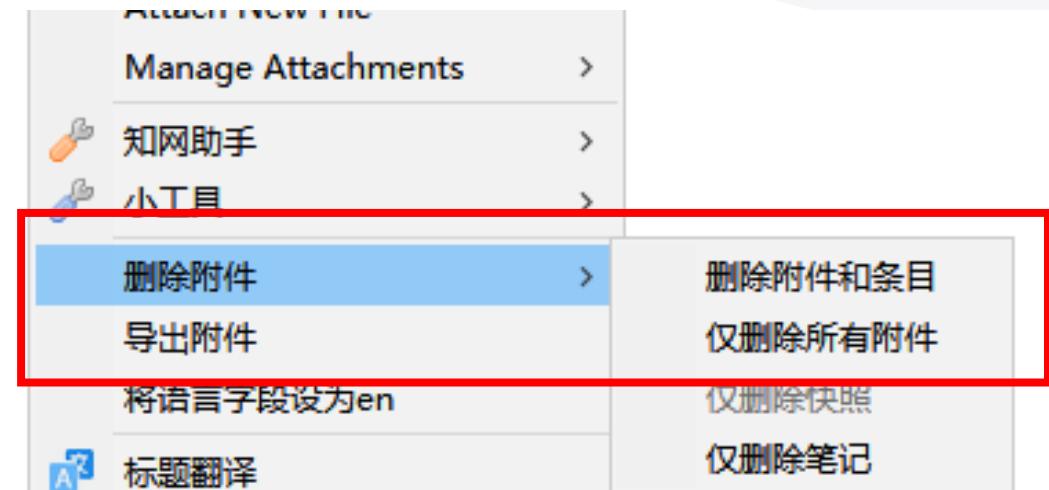
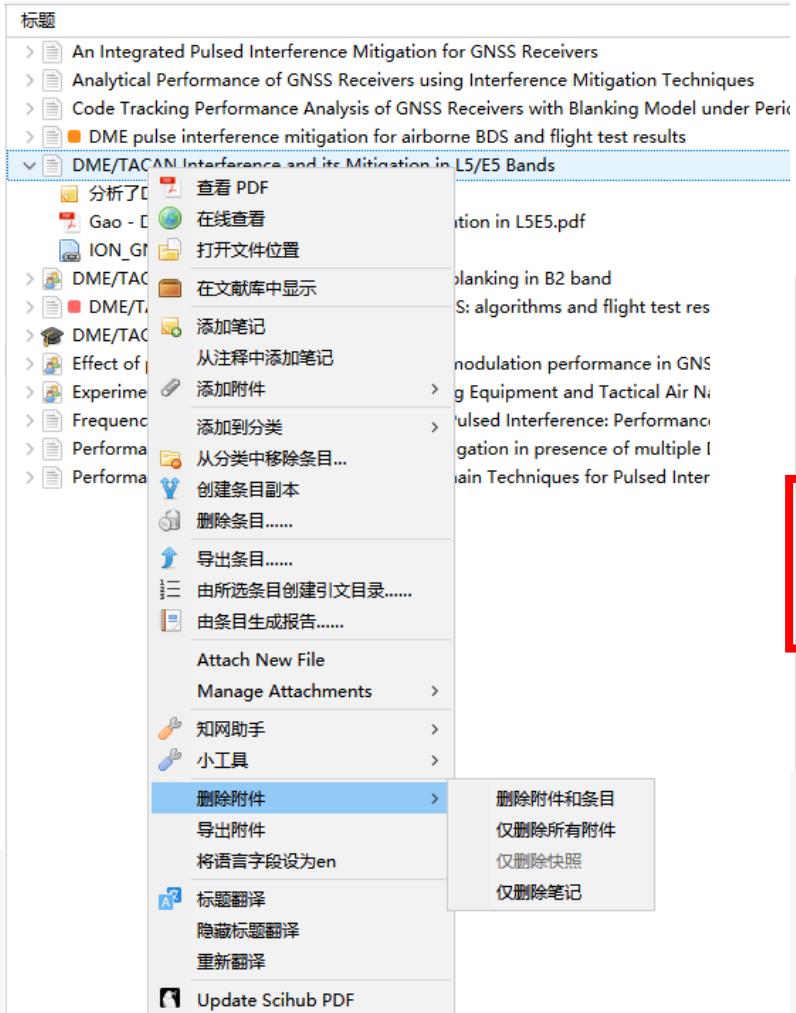
/ Delitem



Delitem

删除条目的同时删除附件

- Delete the item and all its attachments.





Organization

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Citation

Plugins

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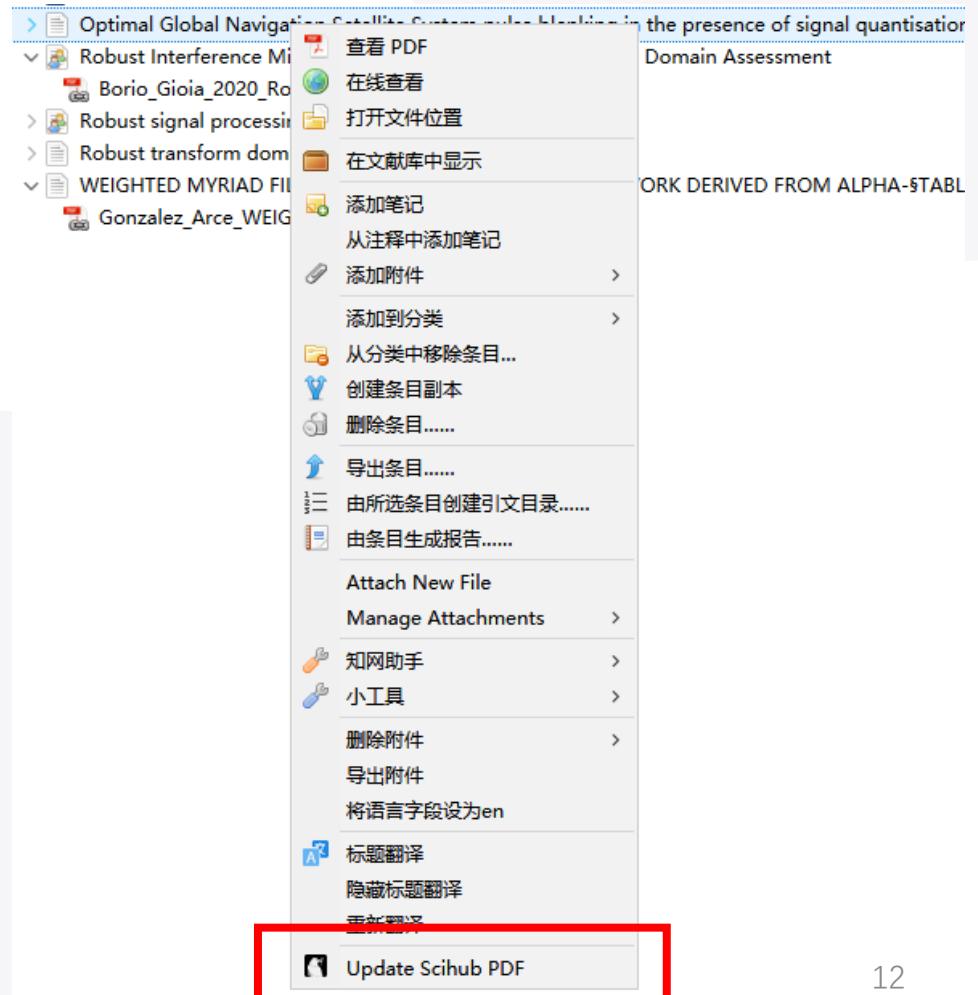
/ Zotero_scihub



Sci-Hub Plugin for Zotero

Download papers and books by DOI from Sci-Hub

- Directly download paper from Sci-Hub.
- Quick and convenient





zotero



Organization



Notes



Citation



Plugins



Collaboration

Zotero_pdf_translate



Zotero PDF Translate

This is an add-on for [Zotero 6](<https://www.zotero.org/>).

- Translate the selected sentences into Chinese.

1 Introduction

When available, global navigation satellite system (GNSS) is the technology of choice for most position-related and precise synchronisation applications [1]. The reasons are due to its dedicated infrastructure, Earth coverage, medium-to-high accuracy and large market penetration. As a matter of fact [2], GNSS is extensively used around the globe, with 3.6 billion GNSS devices in use in 2014, out of which 3.08 billion are integrated into smartphones for location-based services, followed by 0.26 billion devices used for road applications in intelligent transportation systems. Additionally, there are many other services and businesses that rely on GNSS performance and reliability such as – in increasing market share – surveying, precise agriculture, maritime and aviation transportation.

Even very simple jamming devices can disrupt GNSS-based services in wide geographic areas. Although these jammers are relatively easy and cheap to build, unintentional interference events can occur. In addition, interference events can have been caused by malicious actors. In order to detect and characterise these interference events, it is necessary to understand the underlying mechanisms. This paper presents a comprehensive study of GNSS interference detection and mitigation techniques. It also discusses the challenges and opportunities for future research in this field.

To counteract the effects of unintentional, a cancellation (IC) [5]. IC and (ii) estimating its waveform from a parameter, the interference term is then subtracted from the observations such as GNSS signals. The IC is used to remove the interference signal from the GNSS receiver. The IC is used to remove the interference signal from the GNSS receiver. The IC is used to remove the interference signal from the GNSS receiver.



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Jasminum

Jasminum

一个简单的 Zotero 中文插件

- Obtain relevant information from CNKI.

The screenshot illustrates the Jasminum plugin's integration with the Zotero interface. On the left, a context menu is open over a research item titled "GNSS接收机独立欺骗探测与消除技术研究". The menu includes options like "在线查看", "浏览文件", and "添加笔记". A sub-menu under "小工具" (Tools) contains "拆分姓名" (Split Name) and "合并姓名" (Merge Name), both of which are highlighted with red boxes. The main window shows two entries for the same document, each with a red box around the "作者" (Author) field. The right side of the window displays the full citation details, including the title, authors, and abstract, with some text in Chinese and English.



Organization

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Citation

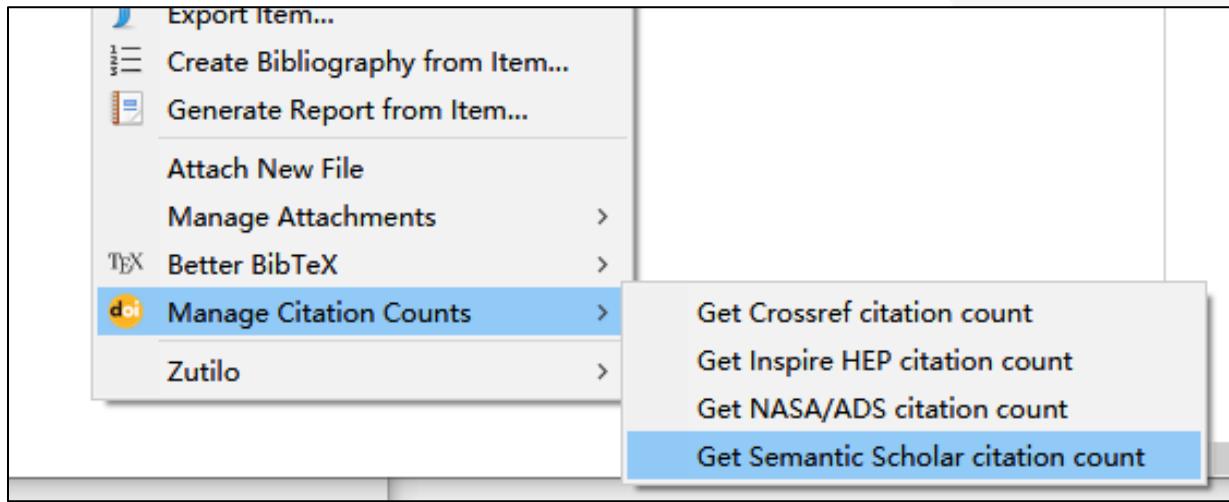
Plugins

Collaboration

Zotero Citation Counts Manager



Zotero Citation Counts Manager
Automatically fetch and update citation...



Extra 1307 citations (Semantic
Scholar/DOI) [2022-04-20]
929 citations (Crossref)
[2022-04-20]
ISSN: 1050-4729



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/ Summary

 Better BibTex for Zotero	Make Zotero useful for us LaTeX holdo... More	Disable	Remove
 Zotero Citation Counts Manager	Automatically fetch and update citation... More	Disable	Remove
Zotero LibreOffice Integration	Integrates Zotero with LibreOffice More	Disable	
Zotero Word for Windows Integration	Integrates Zotero with Microsoft Word for Windows More	Disable	
 ZotFile	Advanced PDF management for Zotero More	Disable	Remove
 Zutilo Utility for Zotero	A utility adding assorted macros for Zo... More	Disable	Remove
 Delitem (disabled)	Delete Item(s) with Attachment(s). More	Enable	Remove
 Jasminum (disabled)	A simple Add-on to enhance Chinese u... More	Enable	Remove
 Sci-Hub Plugin for Zotero (disabled)	Download papers and books by DOI fr... More	Enable	Remove



/ Others

- <https://www.zotero.org/support/plugins>

The screenshot shows a web browser displaying the Zotero support page for plugins at <https://www.zotero.org/support/plugins>. The page has a header with the Zotero logo, navigation links for Home, Groups, Documentation, Forums, and Get Involved, and a search bar. The main content area is titled "Plugins for Zotero" and contains information about the active community of users who have developed various plugins. It includes sections for "New Features and Enhancements" and "Item Metadata Import", listing several specific plugins like "Barcode scanner for iOS", "Zotero Citation Counts Manager", and "Zotero DOI Manager". A "Table of Contents" sidebar on the right lists categories such as Plugins for Zotero, New Features and Enhancements, Library Analysis/Visualization, Website Integration, Word Processor and Writing Integration, Developer Tools, Desktop and Other Program Integration, and Unmaintained. At the bottom, there is a note about the file being last modified on 2022/03/23 at 20:05 by christybyrd.

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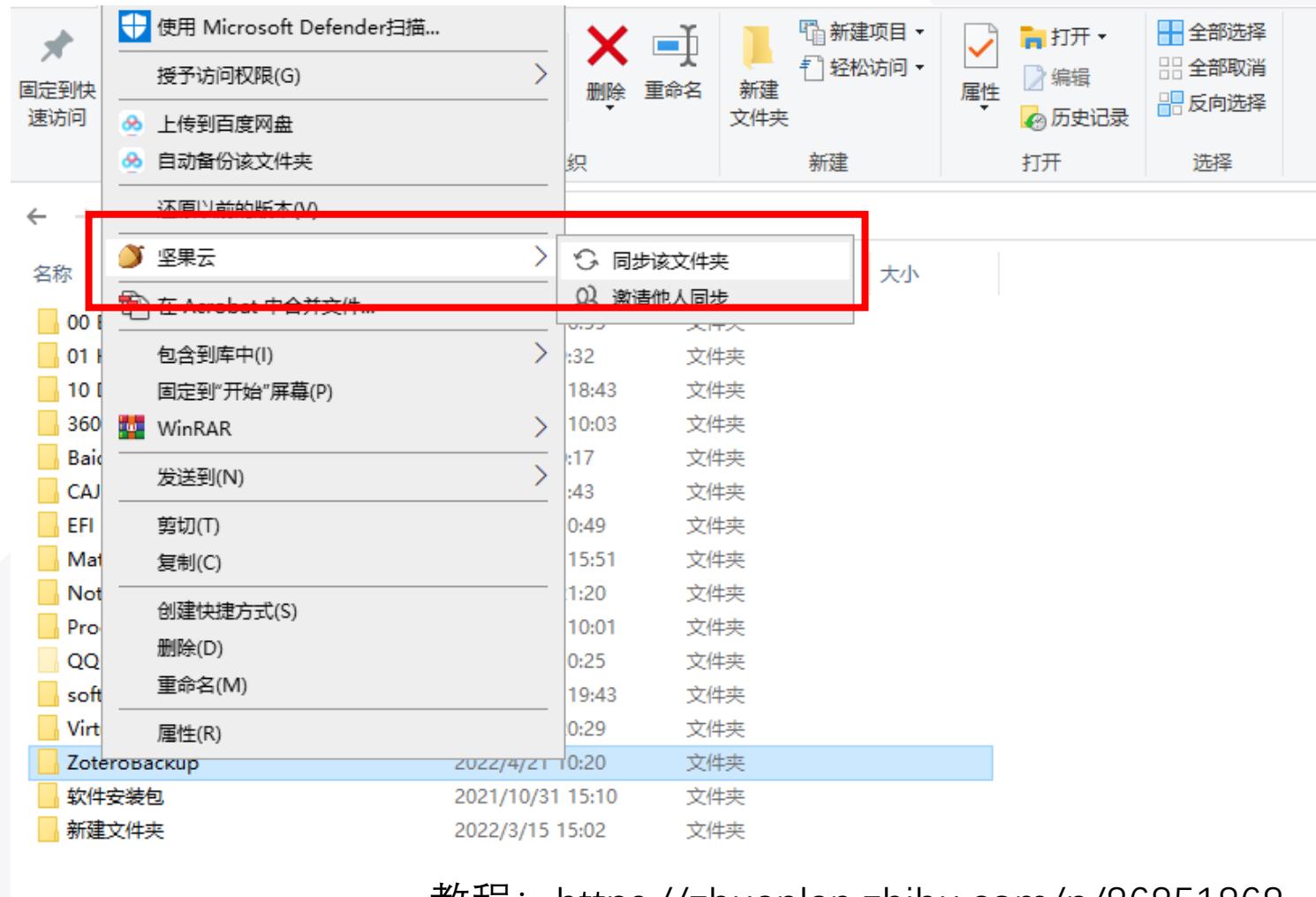
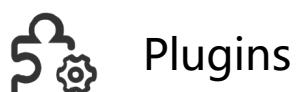
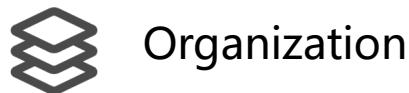
Collaboration



/ Syncing



- Use Zotero on multiple computers with Zotero syncing.





Organization



Notes



Citation



Plugins



Collaboration

/ Groups

- Share group libraries to collaboratively manage research sources and materials, publicly or privately.

The screenshot shows the Zotero application window. At the top, there's a navigation bar with the Zotero logo, a search bar, and tabs for "Groups" (which is highlighted with a red box), "Documentation", and other menu items like "File", "Edit", "View", "Tools", and "Help". Below the navigation bar is a sidebar with sections for "My Library" (including "干扰&兼容性" and "建模方法参考"), "Group Libraries" (with a sub-section for "BUAA_TEST" containing "Nature", "Duplicate Items", "Unfiled Items", and "Trash"), and a "Search for Groups" field. A "Create a New Group" button is also visible. The main content area features a heading "What can groups" and a sub-section "With groups, you can collaborate and so much more." which includes a bullet point "Share your own work". On the right side of the main content area, there's another sidebar titled "群组文库" (Group Library) with sections for "CNS_Research" (containing "重复条目", "未分类条目", and "回收站").

ADVANCED TOPIC OF



zotero

李谨杰

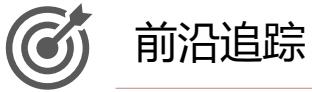
2022年4月29日

/ 如何分类

- 遇到问题：混乱的分类增加查找难度



文献分类



前沿追踪



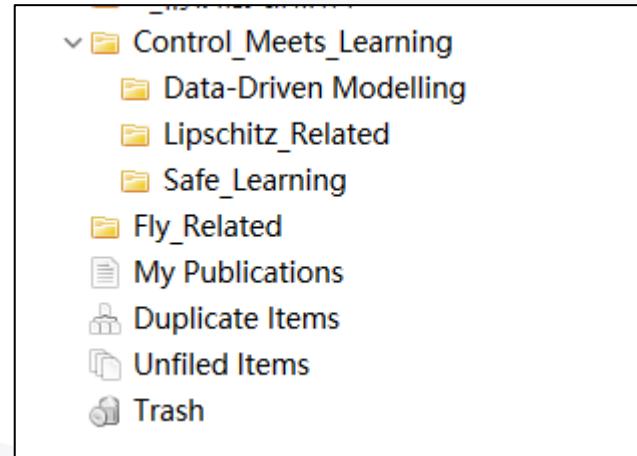
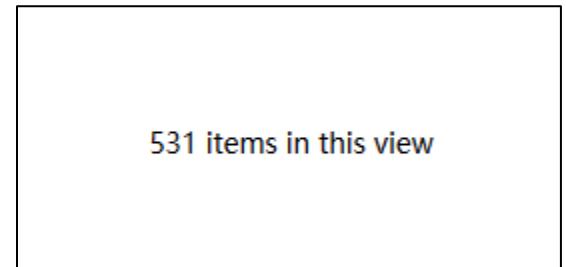
标签状态



为何用纸



只有两点



- 方案一：按项目分。如毕业设计。
- 方案二：按对象分。如四旋翼、固定翼等。
- 方案三：按问题分。如Sensing, Planning等。
- 方案四：按方法分。Deep Learning, Consensus等。



文献分类



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/ 思考过程

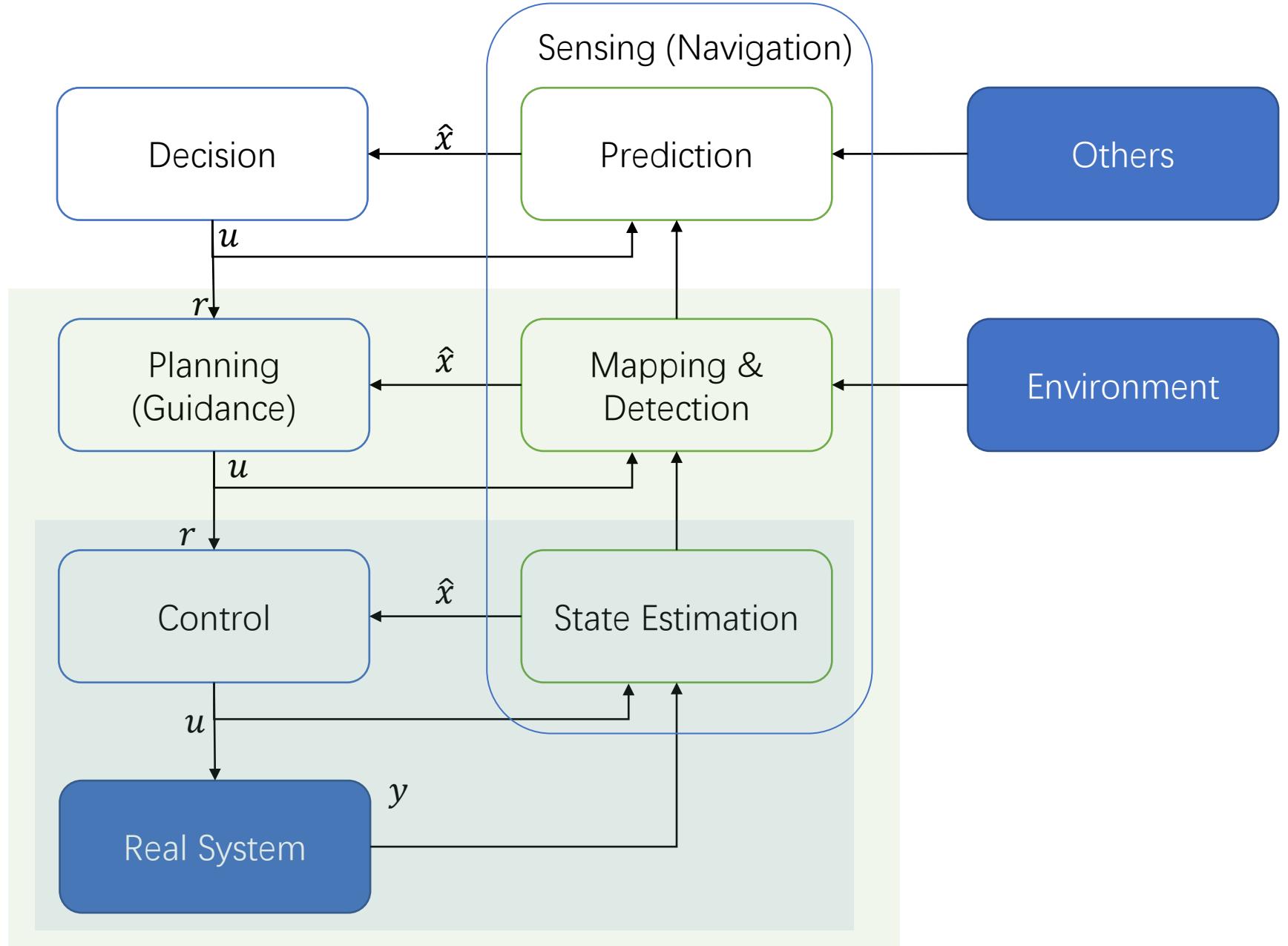
- 目的：文献的组织架构应该有助于建立整个知识体系及跨学科思考。
- 科研的正确方向：寻找一个好的问题

分类标准	优点	缺点	跨学科程度	优先级
项目	高效	长期无积累，对构建知识体系无帮助	较高	1
对象	便于深耕某个对象	不利于进行不同对象间的方法借鉴	低	3
问题	便于构建知识体系	不容易针对一个理论建立分支	高	1 (最高)
方法	便于对一种理论内部的分支有所了解	容易拿着锤子找钉子	低	2

JGCD也说制导一般
不要求稳定性证明了

引入环境变量难以构
造封闭系统，是难以
应用Lyapunov的原因！

Lyapunov的适用范畴？





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 - z_Others
- 1f_Structure
- 1g_Sim_&_Tools
- 1h_Evaluation

- 2_Bioinspired
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 - Learning_MPC
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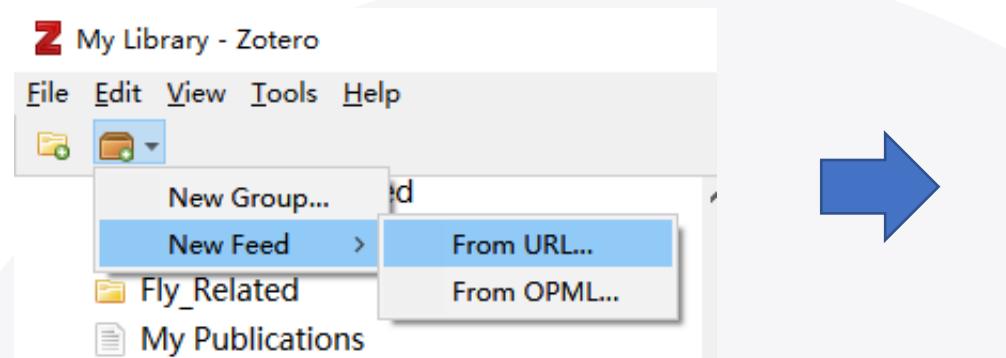
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Vijay Kumar

Professor of Mechanical Engineering and Applied Mechanics, [University of Pennsylvania](#)

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Robotics

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量子位、机器之心、机器人大讲堂等等，群内分享

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/ 一篇文献的奇幻漂流

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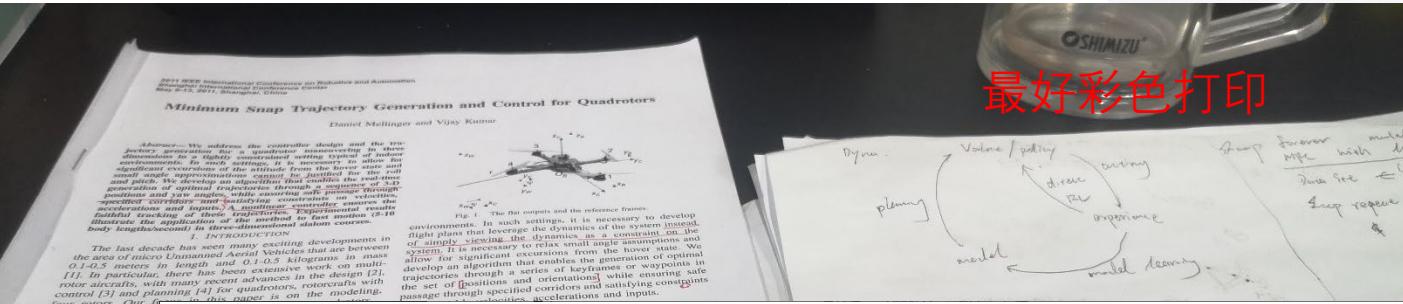
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Title	Creator	Year	
> Vehicle Models and Optimal Control on a Nonplanar Surface	Fork et al.	2022	
> AutoTune: Controller Tuning for High-Speed Flight	Loquercio et al.	2022	
> Performance, Precision, and Payloads: Adaptive Nonlinear MPC ...	Hanover et al.	2022	
> KNODE-MPC: A Knowledge-Based Data-Driven Predictive Contr... [+]	Chee et al.	2022	
> A Comparative Study of Nonlinear MPC and Differential-Flat... [+]	Sun et al.	2022	
> Policy Search for Model Predictive Control With Application to ... [+]	Song and Scaramuzza	2022	
> Agile Aerial Autonomy: Planning and Control [+]	Föhn	2022	
> NeuroBEM: Hybrid Aerodynamic Quadrotor Model [+]	Bauersfeld et al.	2021	
> Data-Driven MPC for Quadrotors [+]	Torrente et al.	2021	
> Controlling Draft Interactions Between Quadcopter Unmanned ... [+]	Matei et al.	2021	
> Accurate Tracking of Aggressive Quadrotor Trajectories Using... [+]	Tal and Karaman	2021	
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作者的blog中写到: encoding invariance to deep learning非常重...			
加州理工的文章, 提出了Neural-Swarm, 一种针对无人机集群接近...			
> IEEE Xplore Abstract Record [+]			
Shi et al_2020_Neural-Swarm.pdf			
> Tilt-Prioritized Quadrocopter Attitude Control [+]	Brescianini and D'A...	2020	
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> Data-Driven Model Predictive Control for Trajectory Tracking Wi... [+]	Carron et al.	2019	
> Neural Lander: Stable Drone Landing Control Using Learned... [+]	Shi et al.	2019	
> Position and attitude control of multi-rotor aerial vehicles: A s... [+]	Nascimento and Sa...	2019	
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> Learning quadrotor dynamics using neural network for flight c... [+]	Bansal et al.	2016	

加州理工的文章，提出了Neural-Swarm，一种针对无人机集群接近飞行的非线性分布式稳定性控制器。本文将一个nominal模型和一个permutation-invariant DNN组合，用DNN去描述高阶的多机间的气流干扰。实验验证了控制器效果的改善（最差的情况改善了四倍），使用反馈线性化保证了足够的计算速度，也验证了向更大规模集群的泛化性。

这篇文章说自己是第一篇研究多个旋翼之间气动干扰的文章，说明这个问题还很新。

本文的核心是这个permutation-invariant DNN，用了三种技巧：

1. permutation-invariant, 这个是Rose Yu讲过的, 用不变性提供守恒性, 增强网络的泛化性能, 是神经网络描述流体的一种常用方法。
 2. spectral normalization, 确保DNN是Lipschitz连续的, 即导致有界, 这个应该是便于证明。这个非常重要, 因为IMU等传感器都是有较多噪声的, 如果不保证这个最后学出的网络毛刺很多, 容易不稳定。
 3. deep sets.

$$\mathbf{f}_a^{(i)} = \mathbf{f}_a(\mathcal{N}^{(i)}) \approx \rho\left(\sum_{\mathbf{x}^{(ij)} \in \mathcal{N}^{(i)}} \phi(\mathbf{x}^{(ij)}, \theta_\phi), \theta_\rho\right) = \hat{\mathbf{f}}_a^{(i)},$$

，想法很简单，就是把几个神经网络加起来，再用一个神经网络代替。每个子神经网络都表示了不同邻居的“contribution”。这种方法的优点是计算量随个体数量线性叠加。

训练流程: cumulative/curriculum learning approach

step1：收集两个关于DNN的四旋翼的飞行数据，学习model

step2: 重复数据收集的过程, 使用learned-model作为前馈项, 以促使两架飞机更近的飞行

¹ 本章所用的“總”指的是一個國家或地區的總體，而不是某個部門或子領域。

收集方式：random walk和swapping。前者是在一个区域内随机飞点，使用

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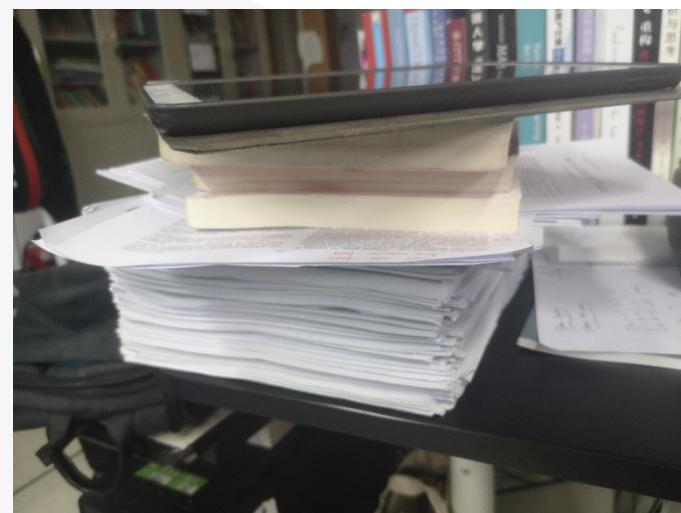


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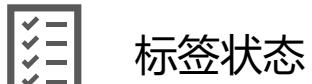




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THANKS

— 李谨杰 —

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