



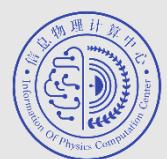
2025-2026-01学期

专业写作基础

第二讲

李晓瑜





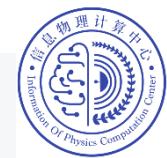
◆ 第二讲内容

- 文献调研的重要性；
- 文献检索的方法与工具；
- 如何阅读文献；
- 文献综述的撰写要求。



多选题 1分

设置



请选择你使用过的搜索引擎，或数据库

- A
- B
- C
- D
- E
- F
- G

百度，及百度学术，或百度文库
谷歌，谷歌学术
知网，或万方
IEEE的IEL
清华大学AMINER
Web of Science
以上都有

提交



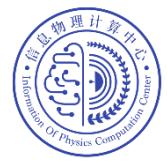
2.1 文献概述

——科研人，不是在写论文，就是在写论文的路上。

一篇高质量的paper，一定会经过查文献、文献管理、翻译、找参考文献、查重等过程，整个过程繁琐艰巨，但是在互联网极度发达的今天，有很多高效的科研小工具，可以极大程度上提升我们写作过程中的效率和幸福感，帮我们顺利地将课题数据转化成文章成果。

怎么读？怎么选？？怎么升华？？？





2.1 文献概述

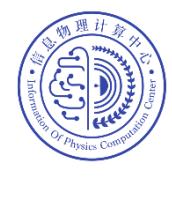


老师们提醒大家：
研究千万条，文献第一条。事前不调研，做完两行泪。

“温故而知新”

知道别人已经做了什么，用什么方法解决了什么问题，以批判性思维角度思考并总结技术现状与趋势，辨识出仍待解决的问题。

通过在各个数据库中去查找、阅读、筛选相关文献的过程，称为文献检索。



2.2 文献概述

3WHC原则

- Why: 为什么要提这个内容，讲这个话，做这件事
- What: 这是个啥，简要明确、定义清楚
- Who: 有没有前人经验
- How: 如何实现
- Conclusion: 简单总结，高屋建瓴

“Why”是立根之本：市场决定内容，需求决定项目。天马行空是艺术，不是科学

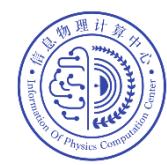
“What”是发矢之地：敌人是谁都不清楚，就难谈攻关。问题越简单明了，越好解答

“Who”是评判依据：有桥过河，干嘛要摸着石头。切忌自以为是，无视进展

解决3W问题，文献检索和综述就尤为重要。

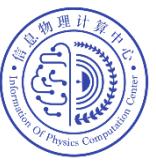


2.2 文献的信息来源



一般的我们科学技术领域，按专业文献语言类别分：

中文



2. 2 文献的信息来源

中文

王者
期刊/专利

钻石
高阶参数索引

黄金
BBS发问、抱专业人士大腿

白银
我不知道，百度知道

青铜
图书馆里找教材

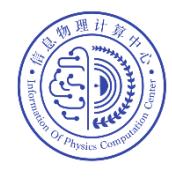
物理学报
Acta Physica Sinica

CNKI 中国知网
www.cnki.net
中国知识基础设施工程

小小露
CSC

Baidu 文库





2. 2 文献的信息来源

专利数据库

- 中国国家知识产权局: <http://cpquery.cnipa.gov.cn/>
- 美国专利商标局: <http://www.uspto.gov/>
- 世界知识产权组织的检索系统: <http://www.wipo.int/patentscope/en/>
- 日本知识产权数字图书馆: http://www.ipdl.inpit.go.jp/homepg_e.ipdl
- 免费专利在线: <http://www.freepatentsonline.com/>
- 谷歌专利: <http://www.google.com/patents>
- 百度专利: <http://zhuanli.baidu.com>
- 其他: 万方、知网等





2.2 文献的信息来源



- 优势：
 - (1) 知识全面，详尽
 - (2) 系统性强
- 带来的问题：
 - (1) 资料老旧、跟不上
 - (2) 耗时耗力、效率低
 - (3) 浮于面上、不解渴
- 常用指数：3颗星



2.2 文献的信息来源



以百度为例，还包括各种非专业搜搜

- 优势：
 - (1) 简单直接
 - (2) 各种马哲、思想汇报福音
- 带来的问题：
 - (1) 不专业、信息含金量低
 - (2) 链接不稳定
 - (3) 容易被坑
- 常用指数：
 - 4颗星

非常希望中国能有个靠谱、好用的学术搜索门户



2.2 文献的信息来源

黄金
BBS发问、抱专业人士大腿

代表性的BBS和公众号、群、学术公众号和微博等等，包括：
校内曾风光无限的



当前市面上很流行的、

知識分子



等等。

专业类BBS、人称学术鱼塘：

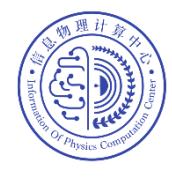
- 优势：
互动性强，有问有答
- 存在问题：
提供信息的人水平参差不齐
- 常用指数：2颗星

学术类APP、人称业界抖音：

- 优势：
时效性好、前沿推的够快
方便查阅、跟得上手机时代

• 存在问题：
科普性大过研究性
常常存在误导和夸大内容

- 常用指数：5颗星



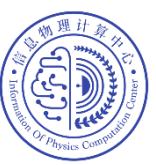
2. 2 文献的信息来源

什么情况下适合用专业类BBS
来检索信息呢？

- 检索通识类比较强的信息
- 向交交志同道合的科研朋友

什么情况下适合用学术类APP
来检索信息呢？

- 关心科普的时候看热闹
- 比较忙的时候看时讯
- 当你成为院士的时候看进展
(朋友圈科研)



2.2 文献的信息来源



Baidu 知网

网页 资讯 贴吧 知道 视频 音乐 图片 地图 文库 更多»

百度为您找到相关结果约14,000,000个

搜索工具

中国知网 官网

CNKI 中国知网

中国知网知识发现网络平台—面向海内外读者提供中国学术文献、外文文献、学位论文、报纸、会议、年鉴、工具书等各类资源统一检索、统一导航、在线阅读和下载服务。涵盖...

www.cnki.net/ - 百度快照 - 579条评论

学校每年花数百万元RMB买数据库
可不是让知识躺着玩的

CNKI 中国知网 www.cnki.net 中国知识基础设施工程

手机版 English 旧版入口 网站地图 帮助中心 购买知网卡 充值中心 个人/机构馆 我的CNKI NEW 欢迎 电子科技大学! 我的机构馆 退出

文献检索 主题 中文文献、外文文献 高级检索 > 出版物检索 >

跨库 > 学术期刊 博硕 会议 报纸 年鉴 专利 标准 成果

单库 > 图书 古籍 法律法规 政府文件 企业标准 科技报告 政府采购

可以说是很丰富了，到这里，文献检索开始真正入门了



2. 2 文献的信息来源



在数据库，你可以检索到全部主流中文发表的：

期刊 博硕士 会议

又称：小论文
对一项研究的专门报导

一般目的明确、数据详实、
研究人员可追溯、靠谱

但读懂它需要一定的专业
积累、有一定门槛

又称：大论文
是授予学位的研究综合体

一般完整性好、兼具基础
和前沿、师生的心血

是领域学生的入门必读

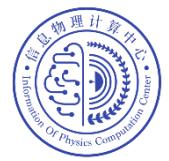
开会报告
一般简单明确
打酱油的居多

文献检索的核心内容
常用性：5颗星
必要性：5颗星



投票 最多可选1项

设置



你知道关于知网与翟天临的故事吗？

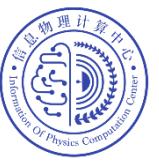
A

知道

B

不知道

提交



“知网是什么东西？” ---翟天临



翟天临学术门

编辑

同义词 翟天临事件一般指翟天临学术门

2019年2月8日，翟天临因在直播中回答网友提问时，不知知网为何物，他的博士学位真实性受到质疑。随后，他又在[新浪微博](#)留言称“只是开玩笑”。翟天临工作室则表示，其论文由校方统一上传，预计将于2019年上半年公开。

2019年2月10日，[四川大学](#)学术诚信与科学探索网将翟天临列入“学术不端案例”公示栏^[1]，2月11日，[北京电影学院](#)成立调查组并按照相关程序启动调查^[2]。2月11日晚，北大光华学院发声明将根据其博士学位授予单位的调查结论做出处理。^[3-4] 2月14日，翟天临通过个人微博发表致歉信。^[5] 2月15日，教育部回应“翟天临涉嫌学术不端事件”称，教育部对此高度重视，第一时间要求有关方面迅速进行核查。^[6] 2月16日下午，[北京大学](#)发布关于招募翟天临为博士后的调查说明：确认翟天临存在学术不端行为，同意翟天临退站，责成[光华管理学院](#)作出深刻检查。^[7]

2019年2月19日，北京电影学院发布关于“翟天临涉嫌学术不端”等问题的调查进展情况说明，宣布撤销翟天临博士学位，取消[陈浥](#)博导资格。^[8]



参考资料

1. 四川大学官网将翟天临列入“学术不端案例”公示栏 [\[1\]](#). 新京报网. 2019-02-10[引用日期2019-02-10]
2. 疑似论文抄袭 北京电影学院成立翟天临事件调查 [\[2\]](#). 新浪网. 2019-02-11[引用日期2019-02-11]
3. 北大回应翟天临涉嫌学术不端:根据调查结论做处理 [\[3\]](#). 网易新闻网. 2019-02-11[引用日期2019-02-11]
4. 翟天临学术造假质疑蔓延进娱乐圈 这些公司“踩雷” [\[4\]](#). 荔枝网[引用日期2019-02-12]
5. 翟天临致歉：申请退出北大博士后工作，配合调查 [\[5\]](#). 海外网[引用日期2019-02-14]
6. 教育部回应翟天临事件：绝不允许出现无视学术规矩行为 [\[6\]](#). 新浪网. 2019-02-15[引用日期2019-02-15]
7. 北大确认翟天临学术不端对其退站 承认把关不严 [\[7\]](#). 新浪网. 2019-02-16[引用日期2019-02-16]
8. 北电宣布撤销翟天临博士学位 取消陈浥博导资格 [\[8\]](#). 新浪网. 2019-02-19[引用日期2019-02-19]
9. 翟天临被北京大学录取读博士后 晒通知书鼓励自己 [\[9\]](#). 网易娱乐网. 2019-01-31[引用日期2019-02-12]

教育部司局函件

国教督办函〔2019〕23号

关于开展2019年全国博士学位论文抽检 通讯评议的通知

有关专家：

根据《教育督导条例》和《博士硕士学位论文抽检办法》要求，为保证博士研究生培养质量，决定开展2019年博士学位论文抽检工作，并委托教育部学位与研究生教育发展中心通过网络平台送专家评审。

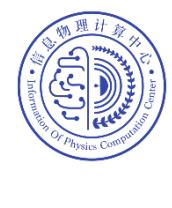
经研究，聘请您为本次博士学位论文抽检的评审专家。请您根据本学科领域博士学位论文的有关要求，本着科学、公正的原则，对送评论文进行认真评议，提出评议意见。

评审结果由我办统一向学位授予单位通报，并以适当方式公开，评审专家不得自行对外提供评议意见及有关信息。论文电子文档仅供本次学位论文抽检专用，请勿外传。

感谢您对学位论文抽检工作的大力支持！

国务院教育督导委员会办公室
2019年6月10日

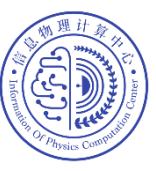
抄送：教育部学位与研究生教育发展中心



翟天临学术门

学术道德，是悬在学者头顶的达摩克里斯之剑！

- 2019年2月8日，翟天临因在直播中回答网友提问时，不知知网为何物，他的博士学位真实性受到质疑。随后，他又在新浪微博留言称“只是开玩笑”。翟天临工作室则表示，其论文由校方统一上传，预计将于2019年上半年公开。
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- 2月11日晚，北大光华学院发声明将根据其博士学位授予单位的调查结论做出处理。[3-4] 2月14日，翟天临通过个人微博发表致歉信。[5]
- 2月15日，教育部回应“翟天临涉嫌学术不端事件”称，教育部对此高度重视，第一时间要求有关方面迅速进行核查。[6]
- 2月16日下午，北京大学发布关于招募翟天临为博士后的调查说明：确认翟天临存在学术不端行为，同意翟天临退站，责成光华管理学院作出深刻检查。[7]
- 2019年2月19日，北京电影学院发布关于“翟天临涉嫌学术不端”等问题的调查进展情况说明，宣布撤销翟天临博士学位，取消陈浥博导资格。[8]



2. 2 文献的信息来源



建立在熟练使用知网等数据库的基础之上

The screenshot shows the homepage of the Chinese Patent Examination Information Query System. At the top left is the logo of the National Intellectual Property Administration (NIPR) with the text "国家知识产权局". At the top right are language selection links: English | Deutsch | Español | Français | 日本語 | 한국어 | Русский. The main title "中国及多国专利审查信息查询" is centered above two large input forms. The left form is titled "电子申请注册用户查询" and features fields for "账号" (Account Number), "密码" (Password), and a CAPTCHA field "请依次点击“阮”“陷”“蜗”". It includes "登录 LOGIN" and "注册 REGISTRATION" buttons. The right form is titled "公众查询" and also has fields for "账号/手机号" (Account Number/Phone Number), "密码" (Password), and a CAPTCHA field "请依次点击“拱”“兜”“普”". It includes "登录 LOGIN", "忘记密码" (Forgot Password), and "公众用户注册" (Public User Registration) buttons. Below the forms are three informational links: "多国发明专利审查信息查询服务简介", "通知 (2018年6月8日)", and "中国专利审查信息查询服务简介". At the bottom left is a green download icon with the phone number "010-62086383". At the bottom right is an orange envelope icon with the email address "query@sipo.gov.cn". The background features a blue sky with white clouds and a green lawn.



2. 2 文献的信息来源

外文（英文）



SPRINGER NATURE

 **WILEY**
ONLINE LIBRARY

英文文献检索建立在对文献检索有一定的了解的基础之上，
相比于中文文献检索，英文文献检索面对的是世界成果，
其中的很多内容发表平台更高，质量更好，当然难度也更大。

英文文献中，我们一般都是检索期刊论文
也就是“小论文”。
有时也检索专利

电子信息领域绕不过去的英文文献几大数据库：

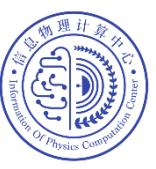
Web of Science

 Clarivate
Analytics

IEEE Xplore®
Digital Library

 AAAS
AMERICAN ASSOCIATION FOR
THE ADVANCE


ELSEVIER



2. 2 文献的信息来源

科技信息门户

<https://scholar.google.com/>
<https://scholar.lanfanshu.cn>

← → C scholar.google.com ⌂

≡ [我的个人学术档案](#) ★ [我的图书馆](#)

Google 学术搜索

🔍

不限语言 中文网页 简体中文网页

← → C sci-hub.tw ⌂



SCI-HUB

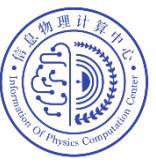
...to remove all barriers in the way of science

enter URL, PMID / DOI or search string



the first website in
the world to provide
mass & public access
to research papers

open



2. 2 文献的信息来源



英文

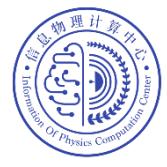
Web of Science



科睿唯安 WOS, SCI的制定者,
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2.2 文献的信息来源



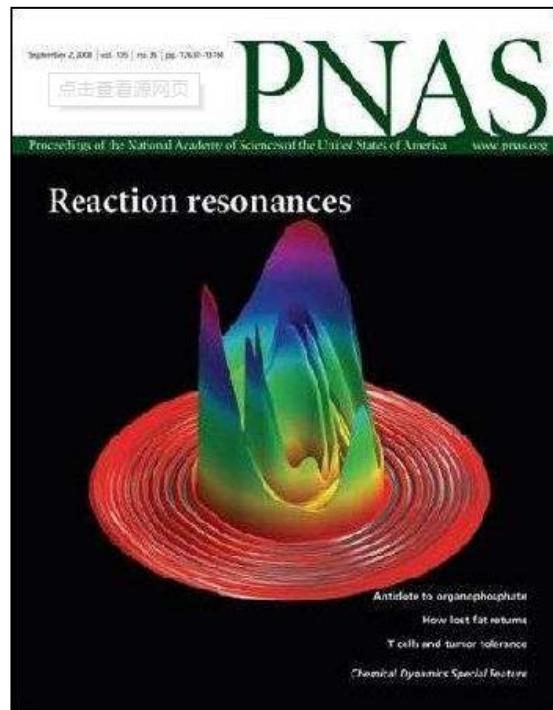
AMERICAN ASSOCIATION
FOR THE ADVANCEMENT OF SCIENCE

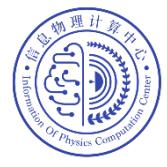
旗下代表期刊



英文

美国科学促进会
灯塔国的科学顶峰机构
非盈利的政府出版数据库
<https://www.aaas.org/>





2.2 文献的信息来源



英文

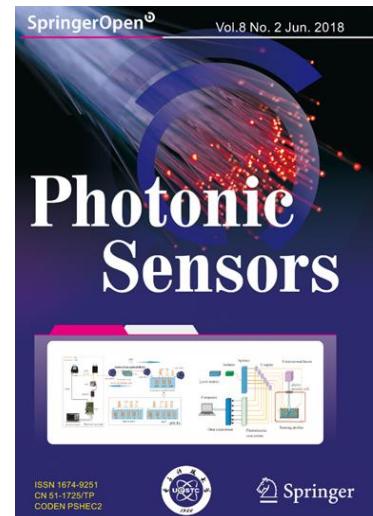
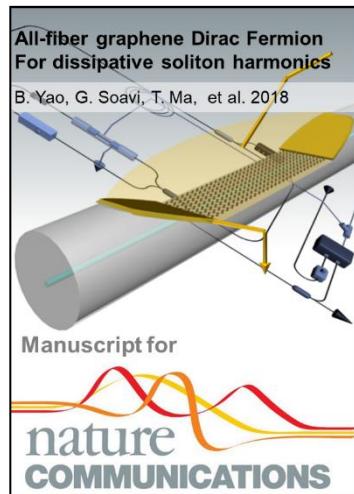
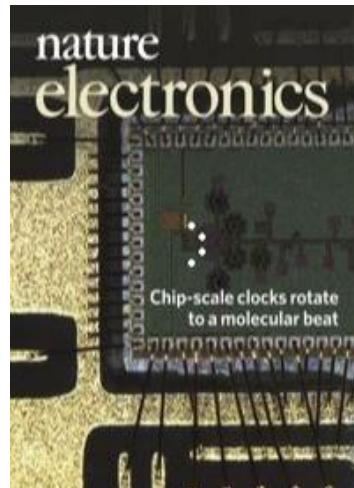
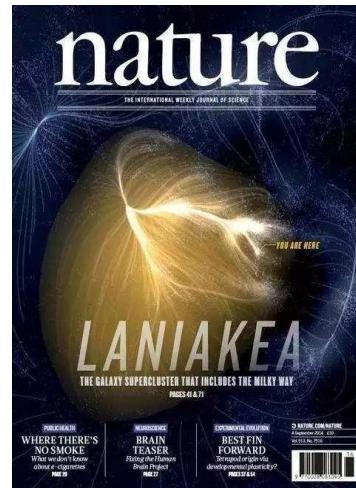
SPRINGER NATURE

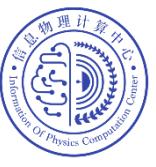
斯普林格 自然
广泛使用的商用科学出版集团
英伦范，高端大气上档次

<https://www.springernature.com>

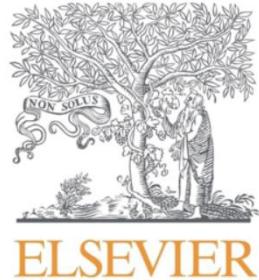
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2.2 文献的信息来源

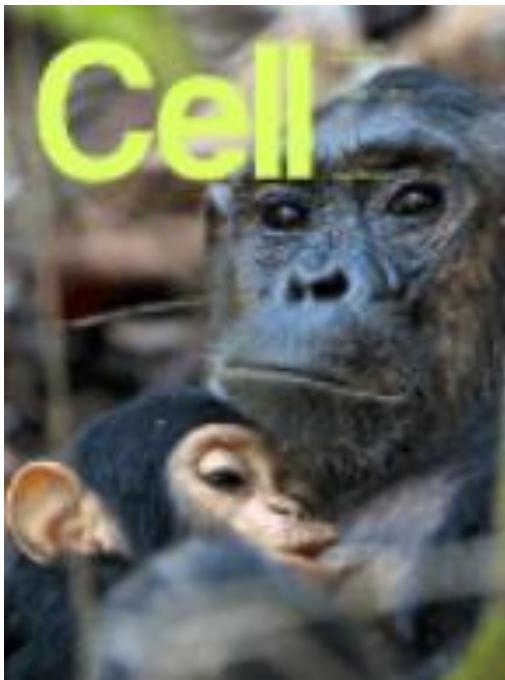


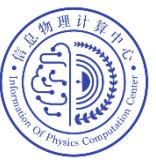
爱思唯尔
标志为：苹果树下的牛顿
科研界的一个大数据中心

<https://www.sciencedirect.com/>

The screenshot shows the ScienceDirect homepage. At the top, there is a search bar with fields for 'Keywords', 'Author name', 'Journal/book title', 'Volume', 'Issue', 'Pages', and a search button. Below the search bar, a large banner features the text: 'More than 1 million researchers are already using ScienceDirect Recommendations'. It explains that the free 'Recommendations' service uses machine learning and online activity to suggest research tailored to needs. A blue button below the text says 'Start receiving recommendations >'. At the bottom of the banner, it says 'Explore scientific, technical, and medical research on ScienceDirect'. Below the banner, there are links for 'Physical Sciences and Engineering', 'Life Sciences', 'Health Sciences', and 'Social Sciences and Humanities'.

旗下期刊扛把子：《细胞》





2. 2 文献的信息来源



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All Enter keywords or phrases (Note: Searches metadata only by default. A search for 'smart grid' = 'smart AND grid')

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国际电子电气工程学会
没听说过IEEE别说自己是UESTC毕业的

<https://ieeexplore.ieee.org/Xplore/home.jsp>

英文

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期刊包括电子电气、计算机类各个技术领域的顶级成果，

IEEE Trans. Of XXX

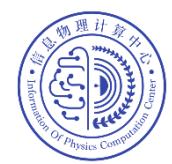
IEEE Proceedings of XXX

IEEE Selected Topic of XXX

IEEE XXX Letters



2. 2 文献的信息来源



英文

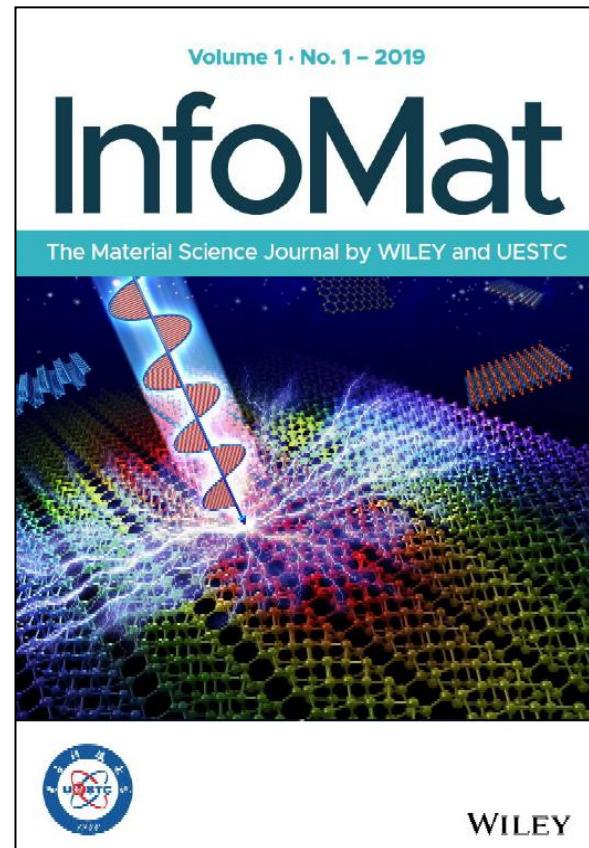


The screenshot shows the Wiley Online Library homepage. At the top, it says "Notice: Wiley has updated its privacy policy, effective 12 February 2019. Please visit www.wiley.com/privacy to review." Below this is the Wiley logo and "WILEY ONLINE LIBRARY". On the right, there are links for "Access by UESTC" and "Login / Register". The main banner features a blue and green abstract background with the text "Accelerating research discovery to shape a better future" and "Today's research, tomorrow's innovation". Below the banner are search fields for "Search publications, articles, keywords, etc." and "Advanced Search". At the bottom, it shows statistics: "1,600+ Journals", "200+ Reference Works", and "21,000+ Online Books".

旗下期刊包括《Adv Mat》《Laser Photon Rev》等。

我校与Wiley合办期刊
创刊主编：李言荣

百年德国出版老店
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The image shows the cover of the journal "InfoMat". The title "Volume 1 · No. 1 – 2019" is at the top. Below it is the large title "InfoMat" in a bold, dark blue font. Underneath, it says "The Material Science Journal by WILEY and UESTC". The cover features a colorful, abstract illustration of a material structure with various layers and patterns in red, blue, and green. At the bottom left is the UESTC logo, and at the bottom right is the WILEY logo.



2.3 学术道德

- 学术道德，是悬在师生、学者头顶的”达摩克斯”之剑！
- 电子科技大学基本学术道德规范及学术不端行为处理办法
- <https://xxgkw.uestc.edu.cn/info/1086/2413.htm>

电子科技大学基本学术道德规范及学术不端行为处理办法

发布日期：2020-10-21 作者： 来源：

第一章 总则

第一条 为规范学术行为、严明学术纪律、维护学术诚信，促进教学科研和学术研究的健康发展，推动学术创新与繁荣，根据《高等学校预防与处理学术不端行为办法》（教育部令第40号）等有关法律法规，结合学校实际，特制定《电子科技大学基本学术道德规范及学术不端行为处理办法》（以下简称处理办法）。

第三章 学术不端行为

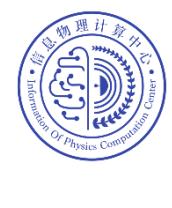
第十二条 在学术活动中由下列行为之一的，应当认定为构成学术不端行为：

- (一)剽窃、抄袭侵吞他人学术成果；
- (二)篡改他人学术成果；
- (三)伪造科研数据、资料、文献、注释，或者捏造事实，编造虚假研究成果；
- (四)未参加研究或创作而在研究成果、学术论文上署名，未经他人许可而不当使用他人署名，虚构合作者共同署名，或多人共同完成研究而在成果中未注明他人工作、贡献；
- (五)在申报课题、成果、奖励和职务评审评定、申请学位等过程中提供虚假学术信息；
- (六)买卖论文、由他人代写或为他人代写论文；
- (七)其他根据学校或有关学术组织、相关科研管理机构制定的规则，属于学术不端的行为。

第五章 学术不端行为的处理

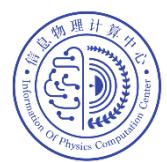
第三十条 学校相关部门根据校学术委员会的认定结论和处理建议，结合行为性质和情节轻重，依职权和规定程序对学术不端行为责任人作出如下处理：

学术不端行为与获得学位直接关联的，依据《电子科技大学学士学位管理及实施办法》《电子科技大学研究生学位授予实施细则》等规定，对学术不端行为责任人，作出暂缓授予学位、不授予学位或者撤销学位等处理。



2.3 学术道德

- 电子科技大学学生纪律处分规定（试行）（校学通知[2005]105号）
 - 第十四条 剽窃、抄袭他人研究成果，情节严重的，给予开除学籍处分。
- 《中华人民共和国著作权法》
- 《中华人民共和国学位条例》
- 国务院学位委员会关于在学位授予工作中加强学术道德和学术规范建设的意见-学位〔2010〕9号
- 教育部《高等学校科学技术学术规范指南》
- 同方知网《学术期刊论文不端行为的界定标准》
- 同方知网《科研诚信技术管理中心学术规范研究资料》
- The IEEE Code of Ethics
- 学术道德规范，中国计算机学会 - CCF



2.3 学术道德

电子科技大学 研究生院
Graduate School of University of Electronic Science and Technology of China

首页 机构设置 线上教学 招生信息 教学管理 专业学位 学位管理 党建思政 学生管理

学位管理

首页 / 学位管理 / 规章制度

规章制度

公告公示

答辩公示

学位证查询

- 电子科技大学研究生学位论文作假行为处理办法
- 电子科技大学研究生学位论文质量问题处理办法
- **电子科技大学研究生学位授予实施细则**
- 博士研究生发表论文的要求 (2018版)
- 工程博士研究生研究成果的要求 (2018版)
- 电子科技大学博士生学术支持计划
- 博士答辩相关链接
- 博士生学术支持计划经费报销相关说明
- 同等学力申请博(硕)士学位实施细则
- 关于办理研究生学位证明书、毕业证明书的规定
- 电子科技大学研究生涉密学位论文和内部学位论文工作管理办法
- 来华留学博士研究生发表论文的要求 (2015版)
- 工程博士研究生发表论文的要求 (2015版)
- 博士研究生发表论文的要求 (2015版)
- 电子科技大学研究生转学科和转导师管理办法

电子科技大学文件

校研〔2020〕7号

关于印发《电子科技大学研究生学位论文作假行为处理办法》的通知

校内各单位：

《电子科技大学研究生学位论文作假行为处理办法》已经2020年第一次校长办公会审议通过，现印发给你们，请遵照执行。

电子科技大学

2020年1月17日

-1-

电子科技大学文件

校研〔2020〕9号

关于印发《电子科技大学研究生学位授予实施细则》的通知

校内各单位：

《电子科技大学研究生学位授予实施细则》已经2020年第一次校长办公会审议通过，现印发给你们，请遵照执行。

电子科技大学

2020年1月19日

电子科技大学文件

校研〔2020〕8号

关于印发《电子科技大学研究生学位论文质量问题处理办法》的通知

校内各单位：

《电子科技大学研究生学位论文质量问题处理办法》已经2020年第一次校长办公会审议通过，现印发给你们，请遵照执行。

电子科技大学

2020年1月17日

-1-



2. 3 学术道德

IEEE关于剽窃(Plagiarism)的定义和讨论

Ethically Speaking



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Plagiarism in Journal Articles

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Keywords: Plagiarize; ethics; reviews

Every May a flock of journal papers fly into my office for review. I submit this migration of journal articles to my desk to the fact that many Associate Editors, professors, and they usually come from other universities who have no time to review them. This year, I got quite a load in the May-June period. Consequently, I had to decline to review several of the submitted articles I tend to be most loyal to IEEE AP-S, then to IEEE, then to other journals of interest, and test first in May that I can't usually review. I get so many in review in May that I use let them pile up in my desk for a few weeks. I started looking through them when I discovered some out-of-theordinary submissions.

I found two articles sent in completely different journals that were nearly identical. The titles were similar and the authors the same. All but one section were word-for-word identical. I guess the editor figured that if they stood that it's work to do something different, then it's not worth it. They could get both published without having a problem. They probably never figured on getting in such reviews. But it's interesting that the same review to both journals does that doesn't plagiarized?

In another journal article, I noticed that the title sounded very familiar. I took a look at the journal. This journal was a journal article sound familiar? I looked at the journal and there were lots of figures. I created several years ago. I checked my files, and found that those authors had copied word-for-word my article and I published many years earlier. They even used my results. In fact, they submitted pictures and put them in their paper (the pictures were blurry). I'm not sure if this happened in me cases, where someone copied my work and tried to publish it in a journal. Or maybe the authors did not realize me I'd already in the same Associate Editors that as one the journal articles to review.

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IEEE Antennas and Propagation Magazine, Vol. 46, No. 4, August 2002

- http://www.ieee.org/web/publications/rights/ID_Plagiarism.html
- http://www.ieee.org/portal/site/tionline/menuitem.130a3558587d56e8fb2275875bac26c8/index.jsp?&pName=institute_level1_article&article=tionline/legacy/inst2004/dec04/12w.pub.xml



An editorial

Plagiarism, Duplicate Publication, and Duplicate Submission: They Are All Wrong!

Recently, the AP-S Transactions and the Magazines have recommended at least six instances of plagiarism (in 3,212, and several dozen instances of chip leak publications and duplicate submission. Fortunately, such problems have been relatively rare. However, there has recently been a noticeable increase in the frequency of these problems. Such practices are morally and ethically wrong. They are against IEEE and AP-S policy. They can and have resulted in very serious consequences for the author(s), the journal, and the IEEE. In the case of plagiarism, the offending author made some measure to obtain documents of the papers, or that what they had done did not cross the definition of the offense. Indeed, in one case, I appeared that the author (University of A) not intended that what they had done was wrong. The following comments are an effort to capture the IEEEap-S's policies regarding these offenses are clearly understood.

Plagiarism

Plagiarism is the use of another person's ideas, texts, words, data, results, or illustrations without giving the actual author proper credit, and thereby is often an representation that the material is one's own. (This definition is based on several sources, the *Sample Report on Plagiarism*, *IEEE Magazines' Policy on Plagiarism*, the *IEEE Magazines' Policy on Duplicate, Unethical, and Other Unacceptable Practices*, and *Editorial Policies of the Chairman-Council Statement*. If you are unsure what's ethical do not give them credit, it is plagiarism. If you use someone else's data or text and do not give them credit, it is plagiarism. If you copy it directly from someone else's paper without crediting the source it is plagiarism. If you use words from someone else's writing without quoting or giving the publications by the journal, friend, etc. These authors are capable of distinguishing great work from copied work from poor work. Any usually can count, though no numbers determine how well you do as a scientist.

We also heard the talk of me sending those "illegal" publications. What I had decided to do the reviews? I actually was justified, given all the journal sections I had piled up. Should these authors be blacklisted? Should they lose their IEEE membership? These authors not only wasted their time, but they were also very untrustworthy of me doing a lot of work. I am concerned that there may be more of these papers slipping through the review process. There are far too many journals to keep up with. Even the authors get reprimanded by one journal, what will stop them from submitting to another?

I'd like to hear more comments about these cases. Have you had any interesting reviews lately? I'm concerned that this may be a bigger problem than most of us realize. How do we handle it?

Editor's note: Readers may also be interested in the related editorials on duplicate submission, duplicate publication, and plagiarism, elsewhere in this issue. WRSI ♀

IEEE Publication Services and Products Board (PSPB) Operations Manual. These are somewhat involved, but for the Society they would typically involve review of the case by the AP-S Periodicals Committee, with notification to the Chair of the PSPB. If it is found that is determined to have occurred, sanctions against the author(s) can be recommended to, and implemented after approval by, the Chair of the PSPB. Per the *IEEE Operations Manual*, the author(s) will be prohibited from publishing in IEEE journals for publication of a notice in the appropriate journal notifying the author from the literature, identification of the full-text of the offending article from the IEEE electronic database, publication of a notice of violation of these Publication Principles in the IEEE electronic database as part of the article's bibliographic record, author responsibility of false publication in IEEE journals by the offending individual(s). In fact, there are a few instances where authors have been prohibited from publishing in our Society's publications for a period of some number of years, and I am aware of at least one instance in which there was a prohibition against an author publishing in all IEEE publications for five years.

In summary, please be careful to give due credit to others in what you write and present. It's the right thing to do.

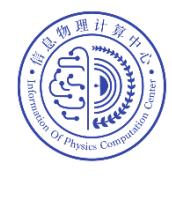
Double Submissions and Double Publication

The following comments are copied in part on the original publication of the *Magazine's* page on this matter. W. R. Storn, "Please Do Your Circuitous About 'Double Submissions,'" *IEEE Antennas and Propagation Magazine*, 35, 6, December 1993, pp. 33-34.

"Double submission" occurs when an author submits the same work to more than one journal. Submission of a signed IEEE Copyright Form to one editor is not considered a violation of IEEE's Copyright Form. Plagiarism of published material violates the terms of the Copyright Form. Plagiarism of published material, indeed, in most cases, is very well-known and easily detectable as plagiarism. Both are considered "prohibited misconduct" by the IEEE. The IEEE's process for handling such cases and the consequences are similar to those identified above for plagiarism.

Note that double submissions and double publishing involves two sets of the same author or authors. Plagiarism involves the work of one author being apparently published in two different journals or conferences. When plagiarism has occurred, determining whether double submission and double publication occur can involve more judgment. In such cases, editors can almost always avoid problems with double publication (and thus, double publication) by giving adequate advance notice (and thus, double publication) by giving adequate advance notice to the editors involved in situations where there might be any question, and asking the Editor(s) to make a determination.

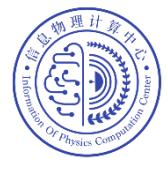
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2.3 学术道德

IEEE对论文剽窃的区分及处罚

- 1、未注明出处地全文复制一篇论文，将导致在该文章记录中注明违规，并吊销违规者在IEEE刊物上的发表权利达5年。
- 2、未注明出处地大量复制（达一半的篇幅）一篇论文，处罚同上。
- 3、未注明出处地照搬句子、段落或插图。可能导致在该文章记录中注明违规，并且必须提交向原始作者的书面道歉以避免被吊销发表权利达3年。
- 4、未注明出处地不恰当地复述整页或整段内容（通过改变个别单词、词组或重排句子顺序）。要求做出书面道歉以避免被吊销发表权利和可能在该文章记录中注明违规。
- 5、注明出处地复制一篇论文的很大一部分，而没有清楚地表明谁做了或写了什么。要求书面道歉，并且必须修改论文以避免被吊销发表权利。



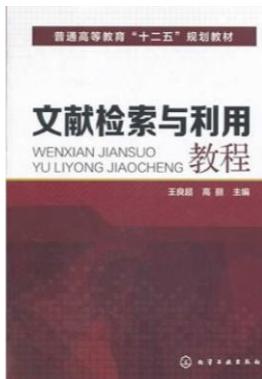
2. 4 文献检索

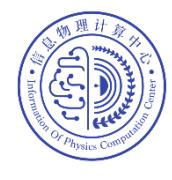
学术搜索引擎大致可分为两大类：横向搜索和纵向搜索。

横向搜索是指在一个平台上(比如谷歌学术)横扫所有的期刊和数据库。

纵向搜索则是在特定的期刊和数据库(比如DOAJ)里搜寻。

有效的文献检索秘诀——现时(Recent)、相关(Relevant)、可靠(Reliable)，检索时注意这些筛选条件，不要一页页的全部下载。





2. 4 文献检索

1. 谷歌学术搜索

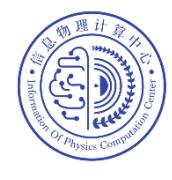
毋庸置疑谷歌学术是最好用的学术搜索引擎。

由于谷歌退出中国市场等许多原因导致谷歌学术搜索不能直接用。

可使用学术搜索镜像：<https://xue.glgoo.net/>，它们搜出来东西和谷歌学术搜索是一样的，不需翻墙可以直接使用。

学术谷歌搜索结果主页有发表的时间，引用的次数，当然你可以点击进入文章的期刊，可以查查期刊的影响因子等。





2.4 文献检索

2.CNKI学术搜索

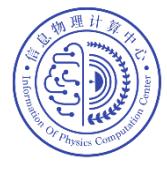
CNKI即中国知识基础设施工程（China National Knowledge Infrastructure），是由清华大学、清华同方发起的信息化建设项目。

经过深度加工、编辑、整合、以数据库形式进行有序管理的，内容有明确的来源、出处，内容可信可靠，包括期刊杂志、报纸、博士硕士论文、会议论文、图书、专利等等。

内容有极高的文献收藏价值和使用价值，可以作为学术研究、科学决策的依据。

The screenshot shows the homepage of the China National Knowledge Infrastructure (CNKI) website. At the top, there are navigation links for '登录' (Login), '个人机构馆' (Personal Institution Library), '帮助' (Help), '充值' (Recharge), '版本' (Version), and '旧版入口' (Old Version Entrance). Below the header, there is a search bar with dropdown menus for '主题' (Subject), '中文文献、外文文献' (Chinese and Foreign Literature), and '高级检索' (Advanced Search). There are also buttons for '出版物检索' (Publication Search) and '出版物' (Publication). A large section of checkboxes allows users to filter results by various types of documents: '学术期刊' (Academic Journals), '博硕' (Theses), '会议' (Conferences), '报纸' (Newspapers), '年鉴' (Yearbooks), '专利' (Patents), '标准' (Standards), '成果' (Achievements), '图书' (Books), '法律法规' (Law and Regulations), '政府文件' (Government Documents), '企业标准' (Enterprise Standards), '科技报告' (Technical Reports), and '政府采购' (Government Procurement). The main content area is divided into three sections: '行业知识服务与知识管理平台' (Industry Knowledge Service and Knowledge Management Platform), '研究学习平台' (Research and Learning Platform), and '专题知识库' (Special Knowledge Database). Each section contains various links to specific services like '知网研学平台' (Zhiwang Research and Study Platform), '大数据研究平台' (Big Data Research Platform), and '新型冠状病毒肺炎 (OA)' (COVID-19). The bottom of the page features a footer with links to '科技创新服务' (Innovation and Technology Services), '社科创新服务' (Social Science Innovation Services), '协同研究平台' (Collaborative Research Platform), '在线教学服务平台' (Online Teaching Service Platform), and '科研项目申报信息库' (Research Project Application Information Database).





2. 4 文献检索

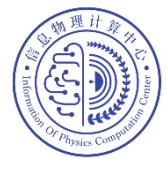
3. DOAJ

Directory of Open Access Journals，由瑞典Lund大学图书馆创建和维护。

DOAJ系统收录期刊的文章都是经过同行评议或严格评审的，质量高，与期刊发行同步，且都能免费下载全文，是做研究的好帮手。

DOAJ的优势在于收录的期刊的有着严格的质量控制，包括很多SCI收录的期刊，收录的OA (Open Access) 期刊数量非常多，属于目前最好的OA期刊目录网站。





文献下载

1、Sci-hub (<http://tool.yovisun.com/scihub>)

SCI-hub的建站理念是消除一切阻碍科学发展的障碍，目前已经拥有超过7000万篇的可供直接下载的学术论文，绕过了出版商的付费壁垒。

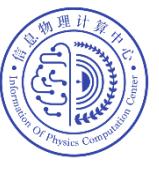
2、Library Genesis (<http://gen.lib.rus.ec/>)

论文很多，下载方便，号称包括所有的外文文献和书籍，也包括中文书籍。

3、OALib (OpenAccess Library) (<http://www.oalib.com/>)

通过提供高质量的文档和快速响应的服务器，致力于为学术交流和进步做贡献。

.....



加油站



如何利用电子科大图书馆资源，
进行高效检索？



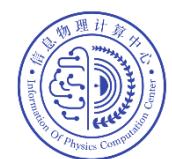
加油站—— 如何调研的文献权威、全面、准确、前沿？

1.选用好用的检索工具

- 1.1数据库类型
- 1.2数据库选取建议（数据权威、收录广泛、检索功能好用）

2.了解正确的检索方法

- 2.1检索策略和检索方法是科学的
- 2.1了解一些科技文献评价指标



1.选用好用的检索工具

1.1 数据库类型 <https://www.lib.uestc.edu.cn/dbs>

文献类型	期刊	图书 学位论文 会议论文 报纸 标准 专利 多媒体 文摘索引 报告 数值数据 年鉴 其他	
学科分类	数学 物理/光学 电子/通信 计算机/自动化 化学/材料 能源/环境 航空航天 生物/医学 经济/管理 法律/政治 语言/教育 文学/艺术	综合 其他	
数据库名称	文献类型	学科分类	数据库简介
Optica数据库(原OSA美国光学学会全文数据库)	其他 会议论文 期刊	电子/通信 物理/光学	美国光学学会 (the Optical Society of America, OSA) , 成立于1916年。OSA是一个科学的、技术性的和教育性的机构。主要从事光学和光子学领域的专业的出版物、学术会议和各种活动。
ACS (美国化学学会)	期刊	化学/材料 物理/光学	美国化学学会成立于1876年, 现已成为世界上最大的科技学会, 会员数超过16万人。ACS出版的期刊, 内容涵盖了24个主要的化学研究领域, 被ISI的Journal Citation Report (JCR)评为“化学领域中被引用次数最多的期刊”。
AIP (美国物理联合会)	会议论文 期刊	物理/光学	AIP (美国物理联合会) 将原OJPS在线服务平台升级为Scitation平台, “Scitation”的名字标明平台内容主要涉及科学和技术领域以及平台采用了强大的引文处理技术。Scitation平台中包含18个科技出版社的110多种科技期刊, 包含大约600, 000篇文献, 并且每月将新增6, 000多篇文献。该数据库由国家科技图书文献中心出资支持联合购买。
APS (美国物理协会)	期刊	物理/光学	APS Journals 是美国物理学会(American Physical Society, APS) 美国物理学会出版发行的网络版数据, 该数据库由国家科技图书文献中心出资支持联合购买。
ACM (美国计算机协会)	会议论文 期刊	计算机/自动化 电子/通信	ACM (Association for Computing Machinery, 美国计算机协会) 创立于1947年, 是全球历史最悠久和最大的计算机教育和科研机构。ACM主要收录了该协会出版的电子期刊 (Journals, Magazines, Transactions) 、会议录 (Proceedings) 、快报 (Newsletters) 等文献。另外还可查到大量其它出版机构的计算机类文献的文摘索引信息。
ASME(美国机械工程师协会)	会议论文 期刊	航空航天 能源/环境 化学/材料 计算机/自动化 电子/通信 物理/光学	ASME (美国机械工程师协会) 成立于1880年。现今她已成为一家拥有全球超过125,000位会员的国际性非赢利教育和技术组织, 是世界上最大的技术出版机构之一。由于工程领域各学科间交叉性不断增长, ASME出版物也相应提供了跨学科前沿科技的资讯。涵盖的学科内容包括: 基础工程、能量转换、能源、环境和运输、一般工程学、材料和结构、制造、材料储运工程, 设备工程和维护、加工产业、纺织工程学、系统和设计、动力系统和控制、电气和电子封装等。
ABI/INFORM	其他 报告 文摘索引 报纸 学位论文 期刊	经济/管理	ABI / INFORM即为Abstracts of Business Information的缩写, 在欧美大学普遍应用的著名商业经济类数据库。主题覆盖财会、银行、商业、计算机、经济、能源、环境、金融、国际贸易、保险、法律、管理、市场、税收、电信等领域, 包括各个行业的市场、企业文化、企业案例分析、公司新闻、国际贸易与投资、经济状况和预测等。
AIAA (美国航空航天学会)	会议论文 期刊	生物/医学 航空航天 能源/环境 化学/材料 计算机/自动化 电子/通信 物理/光学 数学	AIAA (The American Institute of Aeronautics and Astronautics, 美国航空航天学会)是全球最大的航空航天出版机构之一, 被公认为是早期航空航天文献的重要资源。其出版物在世界范围内赢得崇高声誉, 成为了解航空航天历史变革、科研成果和未来发展的重要信息来源。图书馆正式订购了AIAA出版的7种期刊和会议录

全文数据库:

该数据库包含文献的全文

中文: CNKI(知网) 、维普、万方

英文: IEEE Electronic Library、

Nature出版集团系列出版物、

Science Online (科学在线) 、

Elsevier ScienceDirect数据库等等,
约40个。

文摘数据库:

该数据库不包含文献的全文

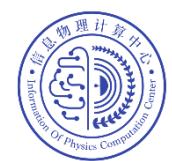
1.2 数据库选取建议

- 1) 数据库类型：优先考虑文摘数据库（数据权威、收录广泛、检索功能好用）
- 2) 数据库包含的学科是否和课题一致

数据库名称	学科范围	文献类型
SCI	自然科学、工程技术、生物医学	期刊
SSCI	人文社会科学	期刊
CPCI	自然科学、工程技术、生物医学	会议
EI	工程技术	期刊、会议、专利、标准
Scopus	科技、医学和社会科学	期刊
INSPEC	物理学、电子学和电机工程、计算机和控制，以及信息技术	期刊、会议

WOS
(Web of Science)





2、检索策略和检索方法

人工智能大模型与通信：XXX

数据库选择

需求分析：

- 1) 学科：计算机和通信两个学科
- 2) 检索需求：确定该交叉学科的子领域:XXX，并检索该子领域的核心文献，撰写一篇综述论文。

选择：

通信和计算机领域数据库：SCI、INSPEC、EI、CPCI

计算机领域：CCF（中国计算机学会）推荐会议，<https://dblp.uni-trier.de/>





- 确定子领域:阅读该交叉学科权威综述文献→检索交叉学科综述文献或用文献分析工具统计找出子领域。

领域初检:

1) 确定检索词

参考工具: CNKI翻译助手 (<https://dict.cnki.net/index>)

人工智能

The screenshot shows a search result page from the CNKI Translation Assistant. The top navigation bar includes a '学术词典' icon, the text '学术词典 (来源于: 期刊论文、博硕论文、会议论文、图书等各类文献资源)', and a '纠错' (Correct) button. To the right, it says '共为您找到 48 个翻译词条, 显示全部译词' with a dropdown arrow. The main content area displays several search results:

词条	数量
artificial intelligence (12042)	
artificial intelligent (183)	
artificial intellegence (19)	
artificial inteligence (17)	
intelligence (24)	
intelligence, artificial (15)	
artifical intelligence (21)	
artificial intelligence technology (14)	



通信：communication、telecommunication

EI或者Inspec叙词表

<https://www.engineeringvillage.com/search/thesaurus.url>

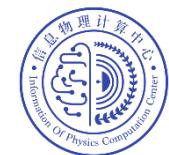
The screenshot shows the search interface for the Engineering Village thesaurus. At the top, there are two search options: "Thesaurus search" and "Vocabulary search", with "Vocabulary search" being selected. Below that, the search term "communication" is entered, preceded by a dropdown arrow icon. A "Database" selection section shows "Compendex" and "Inspec", with "Inspec" being selected. The main results area displays "473 matching terms". The results are presented in two columns:

Term	Term
<input type="checkbox"/> 3G mobile communication	<input type="checkbox"/> aerospace communication
<input type="checkbox"/> 4G mobile communication	<input type="checkbox"/> aircraft communication
<input type="checkbox"/> 5G mobile communication	<input type="checkbox"/> amplify and forward communication
<input type="checkbox"/> 6G mobile communication	<input type="checkbox"/> bandlimited communication
<input type="checkbox"/> acoustic communication (telecommunication)	<input type="checkbox"/> biomedical communication

At the bottom right of the results area, it says "1 of 48 >".



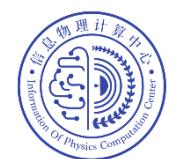
检索词整理



中文检索词	英文检索词	检索词组合
人工智能	artificial intelligence、 artificial intelligent	" artificial intelligence" or "artificial intelligent" or AI
通信	communication、 telecommunication	communication or telecommunication
通信相关词汇:5G、6G、 物联网、无线通信、编 码、数据传输、	5G, 6G, Internet of things, wireless communication, coding, data transmission	5G or 6G or "Internet of things" or "wireless communication" or coding or "data transmission"

检索式

TS=(("artificial intelligence" or "artificial intelligent" or AI) AND (communication or telecommunication or 5G or 6G or "Internet of things" or "wireless communication" or coding or "data transmission"))



选择WOS平台的SCI 和 CPCI文摘数据库进行检索

<https://webofscience.clarivate.cn/wos/alldb/basic-search>

The screenshot shows the Web of Science search interface. At the top, it says "选择数据库: Web of Science 核心合集" and "引文索引: 2 selected". Below this, there are tabs for "文献", "被引参考文献", and "化学结构", with "文献" being the active tab. A search bar contains the query "示例: oil spill* me" and "人工智...". To the right, there is a sidebar titled "研究人员". The main search area lists several databases with checkboxes:

- Science Citation Index Expanded (SCI-EXPANDED)--1991-至今
- Social Sciences Citation Index (SSCI)--2005-至今
- Conference Proceedings Citation Index - Science (CPCI-S)--2001-至今
- Current Chemical Reactions (CCR-EXPANDED)--1985-至今
- Index Chemicus (IC)--1993-至今

At the bottom right of the search area are buttons for "清除" (Clear) and "检索" (Search).

3、了解一些科技文献评价指标

高被引论文、热点论文、被引频次……

14,627 条来自 Science Citation Index Expanded (SCI-Expanded), Conference Proceedings Citation Index - Science (CPCI-S) 的结果。

分析检索结果 引文报告 创建跟踪服务

TS=(("artificial intelligence" or "artificial intelligent" or AI) AND (communication or telecommunication or 5G or 6G or "Internet of things" or "wireless communication" or coding or "d...")

添加关键词 快速添加关键词: ARTIFICIAL INTELLIGENCE INTERNET OF THINGS ARTIFICIAL INTELLIGENCE AI 6G 6G MOBILE COMMUNICATION EDGE AI 检索

出版物 您可能也想要... 复制检索式链接

精炼检索结果 在结果中检索... 搜索图标

快速过滤 高被引论文 (345) 热点论文 (26)

0/14,627 添加到标记结果列表 导出

排序方式: 相关性 1 / 293

1 Toward the 6G Network Era: Opportunities and Challenges

Tomkos, J.; Kionidis, D.; (...); Theodoridis, S
Jan-feb 2020 | IT PROFESSIONAL 22 (1), pp.34-38

The next generation of telecommunication networks will integrate the latest developments and emerging advancements in connectivity infrastructures. In this article, we discuss the transformation and convergence of the fifth-generation (5G) and Internet of things technologies, toward the emergence of the smart sixth-generation (6G) networks which will employ...

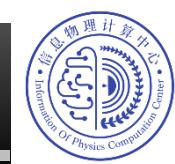
出版商处的免费全文 ...

2 Leveraging AI-enabled 6G-driven IoT for sustainable smart cities

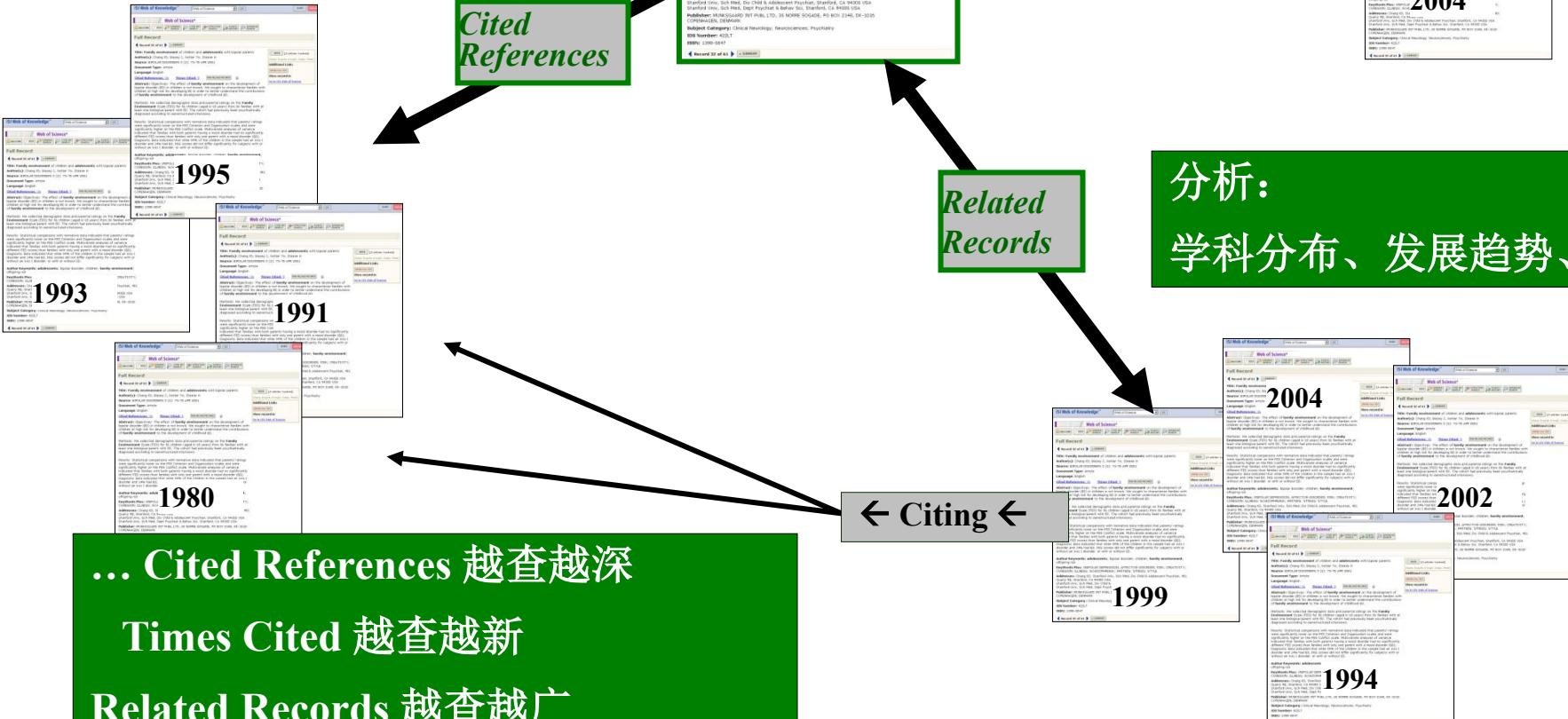
Gera, B.; Raghuvanshi, Y.S.; (...); Sharma, P
Nov 2023 | INTERNATIONAL JOURNAL OF COMMUNICATION SYSTEMS 36 (16)

相关性 最近添加 New 引文类别 日期: 降序 日期: 升序 被引频次: 最高优先 被引频次: 最低优先 使用次数(所有时间): 最多优先 使用次数(最近 180 天): 最多优先 会议标题: 升序 会议标题: 降序 第一作者姓名: 升序 第一作者姓名: 降序 出版物标题: 升序 出版物标题: 降序

利用文摘数据库进行科研分析

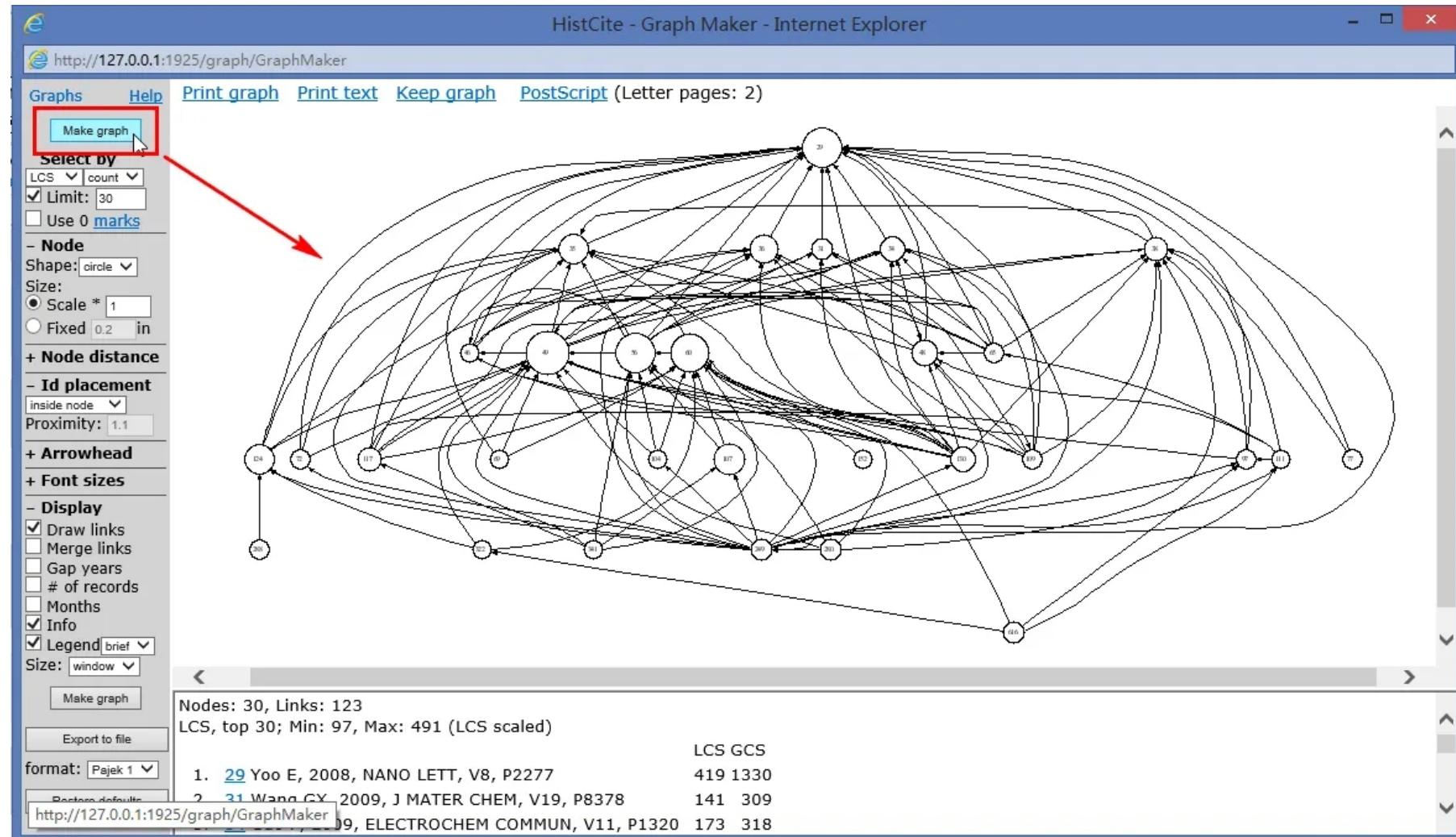


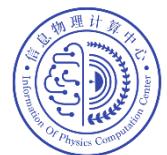
从一篇高质量的文献出发
沿着科学研究的发展道路...



挖掘核心文献的简单工具：HistCite

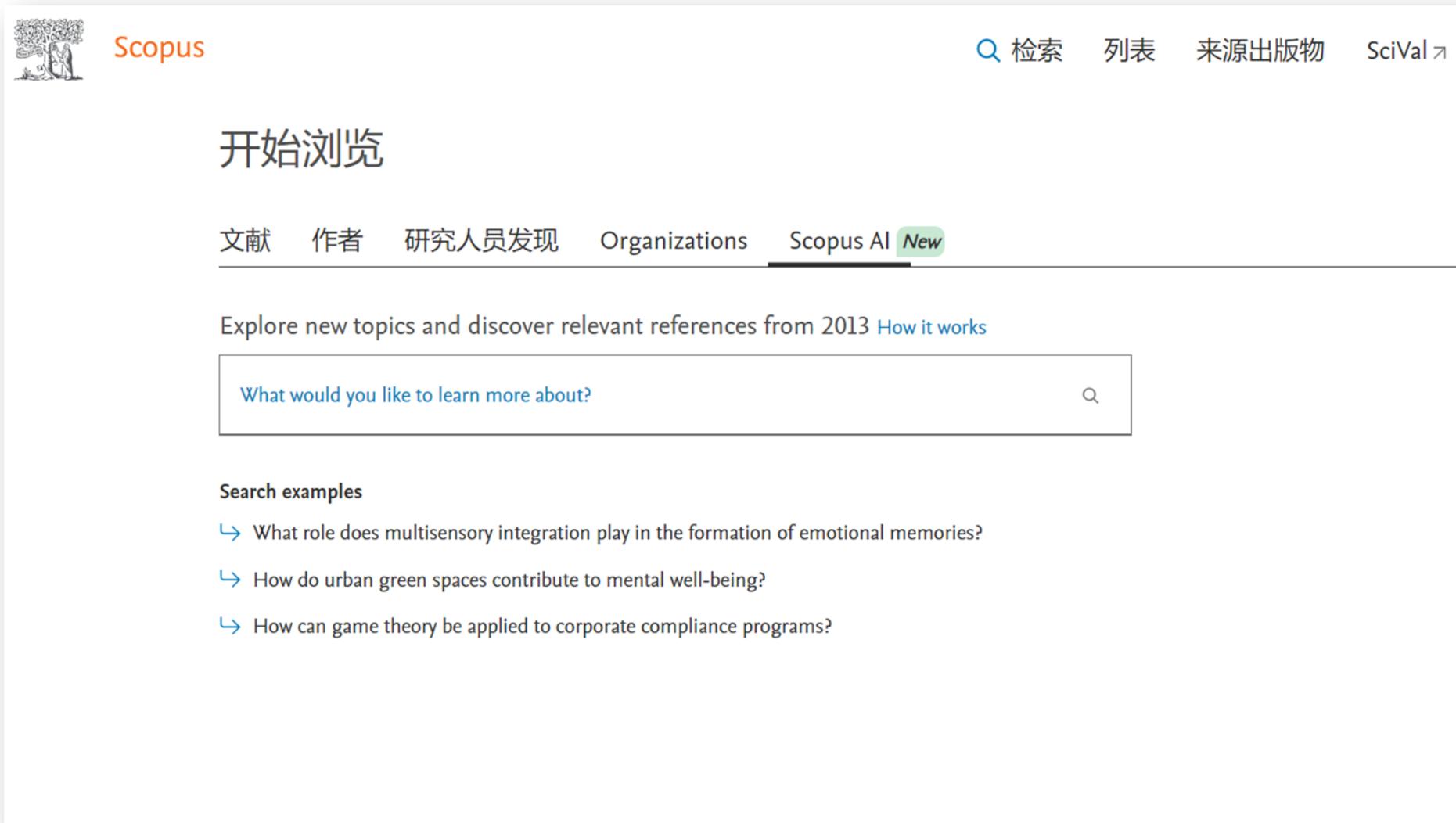
<https://zhuanlan.zhihu.com/p/20902898>



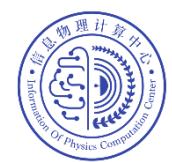


AI检索工具：Scopus AI

(<https://www.lib.uestc.edu.cn/dbc?id=80>)



The screenshot shows the Scopus AI homepage. At the top left is the Scopus logo with a tree icon. To the right are search and navigation links: 检索 (Search), 列表 (List), 来源出版物 (Source Publications), and SciVal. Below the header is a large button labeled "开始浏览" (Start Browsing). A horizontal menu bar follows, with "文献" (Documents), "作者" (Authors), "研究人员发现" (Researcher Discoveries), "Organizations", and "Scopus AI" (highlighted with a green "New" badge). Below the menu is a search input field containing "What would you like to learn more about?" with a magnifying glass icon. A section titled "Search examples" lists three queries: "What role does multisensory integration play in the formation of emotional memories?", "How do urban green spaces contribute to mental well-being?", and "How can game theory be applied to corporate compliance programs?".



这个工具能做什么

1、Scopus AI能不能帮我写现成的论文？

不能！

2、Scopus AI能不能帮我找到我最需要的论文？

能！而且很快！

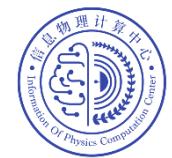
3、Scopus AI能不能帮我梳理知识体系？

能！而且也很快！

Scopus AI的目标：加速知识的发现过程，改变学术发现方式



演示



- 问：人工智能大模型在通信领域有哪些方面使用？
(What are the uses of artificial intelligence models in the field of communication?)



Scopus AI: 将海量的文献内容转化为可用的知识脉络

1. 设计一个想要了解的科学问题

Explore new topics and discover relevant references from 2013 [How it works](#)

What would you like to learn more about?

What are the uses of artificial intelligence models in the field of communication?

人工智能大模型在通信领域有哪些方面使用?

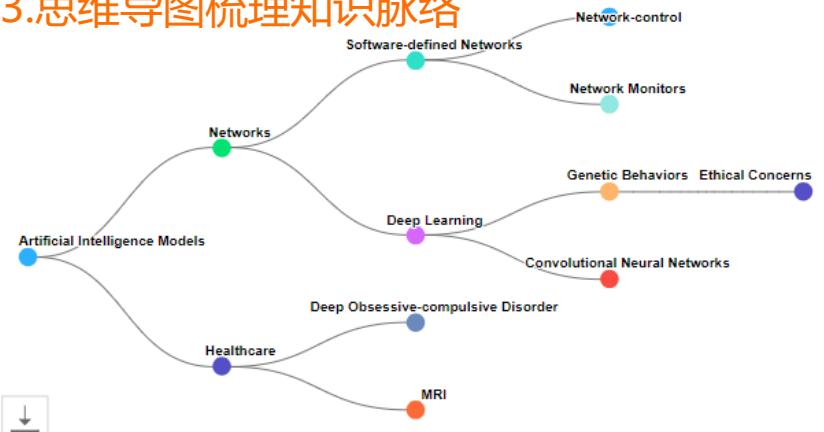
2. 得到科学问题的初步总结

Based on the abstracts provided, the uses of artificial intelligence (AI) models in the field of communication can be summarized as follows:

- **AI in Communication:** AI is widely utilized in communication, leveraging big data, machine learning, and cloud computation to enhance communication efficiency [1](#).
- **Ethical Concerns:** The integration of AI with communication technologies raises ethical concerns, including privacy and misinformation, emphasizing the importance of an ethical approach when using AI in communication [2](#).
- **AI's Role in Human Communication:** AI serves as a communicator or mediator, impacting the discovery of new concepts, frameworks, and theories.
- **AI-Driven vs. Human Communication:** AI-driven communication fosters connectivity and efficiency.
- **Future Development:** The future development of AI in communication includes the use of Software-defined network (SDN) and Network function virtualization (NFV).

However, it's important to note that while AI has shown great promise in enhancing communication and the associated ethical concerns, there are also challenges. Therefore, the abstracts only provide a partial view of the current state of AI in communication.

3. 思维导图梳理知识脉络



4. 扩展总结

Expanded summary

Based on the user's query, the applications, benefits, and models in communication technology can be explored. In the relevant abstracts:

Applications of AI Models in Communication Technology

- AI is increasingly integrated with communication technology, addressing [1](#).
- AI is expected to play a pivotal role in the design and operation of rapidly escalating complexity [2](#).
- AI is utilized in electronic communication for network management, applications, and data collection and integration [3](#).
- NTT Communications actively introduces AI in its operational business models using AI [4](#).
- AI technologies such as machine learning, natural language processing, and communication to process large datasets, understand language [5](#).

Benefits of Using AI in Communication:

- AI is leveraged for specific applications that benefit from marketing, and machine monitoring [6](#).
- AI technologies are used to improve customer experience, personalized recommendations and services in communication [7](#).

Improvement of Communication Systems with AI Models

- AI-mediated communication (AI-MC) raises new questions in communication and requires re-evaluation of many key communication issues [8](#).
- AI offers speed in communication but lacks depth, highlighting the need for a balanced approach when using AI in communication [9](#).

Challenges of Implementing AI Models in Communication

- The convergence of AI and communication technologies need to be addressed [10](#).
- Ethical concerns, including privacy and misinformation, pose significant challenges in the implementation of AI in communication [11](#).

5. 参考文献-确认信息来源

Summary references

Reference 1 • 1 citation

[Research on Application of Artificial Intelligence in Communication Network](#) ↗
Bai, Z. ↗

[Journal of Physics: Conference Series](#) ↗ 2022
Show abstract ▾

Reference 2 • 0 citations

[A systematic review of communication augmented by human intelligence and artificial intelligence](#) ↗
Ahmad, A. ↗, Prasad, P.V.S. ↗

[Exploring Ethical Dimensions of Environmental Sustainability and Use of AI](#) ↗
2023
Show abstract ▾

Reference 3 • 2 citations

[The Need for AI Ethics in Higher Education](#) ↗
Sam, A.K. ↗, Olbrich, P. ↗

[SpringerBriefs in Ethics](#) ↗ 2023
Show abstract ▾

6. 扩展问题，或者提问下一个问题

Go deeper

↳ How are artificial intelligence models being used to enhance natural language processing in communication?

↳ What role do AI models play in improving speech recognition and voice assistants in the field of communication?

↳ How are AI models being utilized to analyze and interpret sentiment in social media communication?

总结

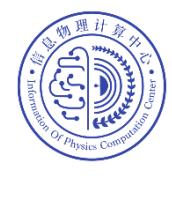


- 选择专业的文献检索工具：文摘数据库
- 制定检索策略：课题思考、技术路线分解、检索词表制定
- 建议：平时在学校中关注和提升自我信息素养

The screenshot displays a library's online service portal. At the top, there are sections for '常用数据库' (常用数据库) and '常用应用' (常用应用), each listing various services with icons. Below these are three main columns: '格物致知-八角学堂' (lectures), '资源动态' (resource dynamics), and '新闻公告' (news announcements). The '格物致知-八角学堂' section shows scheduled events for March 21, April 11, and April 18, each with a title, date, time, and a '预约' (appointment) button. The '资源动态' section lists recent news items with dates. The '新闻公告' section lists news items from 2019 to 2024.

日期	星期	时间	活动标题	预约人数
03-21	星期四	16:30	如何快速厘清领域研究现状 CiteSpace入门介绍	116
03-28	星期四	16:30	文献调研助你站在巨人肩上	58
04-11	星期四	16:30	科研发现早知道——你需要了解的预印本资源	36
04-18	星期四	16:30	全文获取攻略——如何高效地查找全文资源	45

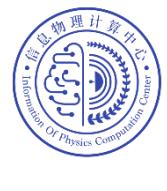
- 相关课程：
《信息检索与利用》，16学时，60人。
- 大赛：西部大学生信息素养大赛（每年秋季）



2.5 文献管理



文献管理的目的是为了高效的利用。有些同学根据文献方向将文献分类放在一个个子文件中，这样你花在“把这篇paper放在哪个文件夹里好”或许比你阅读一篇文献的时间还长，因为你很难把一篇文章限定在某一个你设定的子文件中，普通的一篇文章可能囊括很多方面，对于信息量大，维度多，话题性也强的文章尤其突出，这时候就需要用到**文献管理工具**。



2.5 文献管理

(1) Endnote

由汤森路透开发强大的文献管理软件，功能最全，最老牌，支持各类国际期刊3776种参考文献格式，写作模板多达数百种涵盖各个领域的杂志。可以直接把文献都拖入到EndNote中，会自动生成文献列表。而且还有用word加载项来运行，在word中也有链接可以用。

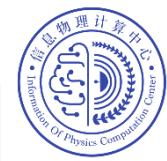
(2) Zotero

Zotero用于文献管理，最突出的特点就是资源直接从浏览器添加，不需要下载后再导入软件中。当你浏览网页时，浏览器地址栏中会出现一个标签一样的小图标，点击一下即可保存，这些信息均由Zotero自动识别完成，不需要人工手动输入。安装时设置好的话，还可以直接下载PDF文档。



多选题 1分

设置



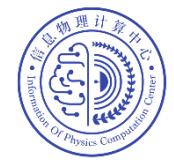
通常你看一篇6页中文论文要多久

- A 10分钟以下
- B 11~30分钟
- C 30分钟至1小时
- D 至少1小时

提交



加油站



功夫不负有心人



<http://blog.science.net.cn/blog-1381219-1197128.html>

科研十问之 “囫囵吞枣” 阅读学术论文



<http://blog.science.net.cn/blog-1381219-1200685.html>

科研十问之 “细嚼慢咽” 阅读学术论文



<http://blog.science.net.cn/blog-1381219-1207409.html>

科研十问之 “反刍消化” 阅读学术论文



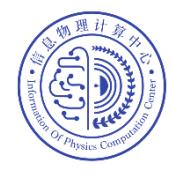
2.6 文献阅读

找到了文献，怎么读才是正确的姿势呢？

学位论文
又叫
大论文

期刊论文/会议论文
又叫
小论文

专利



2.6 文献阅读-学位论文

学位
论文

一个典型的硕士/博士学位论文提纲，都讲啥呢

- 摘要
- 第一章 引言/绪论
- 第二章 理论分析或技术基础
- 第三章到第七章 具体研究内容
- 第八章 结论与展望
- 致谢
- 参考文献

应该先看，确认这篇论文是不是你关心的topic

如果你是新手，建议仔细看，
想想别人是怎么引入主题的
而且，还可以进一步找到新的文献

本文的核心内容，判断本文的
科学价值
阅读方法：看图说话

简要的总结，
一般提炼了本文最有价值的东西



2.6 文献阅读-学位论文

Ka波段MMIC驱动级放大器芯片设计_严方耀

摘要

21世纪，无线通信行业迎来了黄金时代，传统的有线通信逐渐被现代无线通信取代。随着民用无线通信事业的飞速发展，低频段的无线频谱资源逐渐趋近于饱和。在这种背景下，民用无线通信开始转向高频频段，如K、Ka波段，针对Ka波段无线通信相关技术的研究极具发展潜力。驱动级放大器在Ka波段等高频段无线通信系统中扮演着十分重要的角色，尤其是在雷达、卫星等远距离通信系统中，驱动级放大器可以提供合适的信号功率给末级功率放大器，促使末级功率放大器工作在良好状态，保证信号的有效发射。然而，目前针对较低频段如X波段的驱动级放大器的研究较多，鲜有关于Ka波段驱动级放大器的研究。因此，研制高性能的Ka波段驱动级放大器芯片对现代无线通信事业的发展具有重要意义。

本文采用 $0.15\text{ }\mu\text{m}$ InGaAs pHEMT 工艺设计制作了一款面向卫星通信终端应用的Ka波段 MMIC (Monolithic Microwave Integrated Circuit) 驱动放大器芯片。芯片具有小尺寸、低功耗、宽频带的优点，适用于其他主流 Ka 波段通信系统。芯片采用单电源供电设计，内部自偏置栅极-源极电压，外部供电方便。为了实现较高的线性增益，芯片采用两级级联拓扑结构，裸片尺寸为 $1.7\text{ mm} \times 1.0\text{ mm}$ 。芯片电磁仿真结果表明，在漏极电压为 3 V 的条件下，在 $28\text{~}32\text{ GHz}$ 内，芯片线性增益为 16.4 dB ；端口回波损耗小于 -10 dB ；增益 1 dB 压缩点输出功率大于 9.1 dBm ；芯片饱和输出功率大于 11 dBm ；芯片直流动功耗小于 88.5 mW 。芯片在常温下的测试结果显示，在漏极电压为 3 V 的条件下，在 $28\text{~}32\text{ GHz}$ 内，芯片线性增益最大值为 20 dB ；增益 1 dB 压缩点输出功率可达 11 dBm ；饱和输出功率可以达到 13 dBm ；芯片总直流动功耗小于 84.6 mW 。本文对比分析了驱动放大器芯片测试结果与电磁仿真结果，并针对其差异产生的原因进行了分析。

为了将驱动放大器芯片更好地应用于实际工程项目中，本文基于所设计的驱动放大器芯片设计并制作了一个驱动放大器功能模块。常温下模块的测试结果表明，在漏极电压为 3 V 的条件下，在 $28\text{~}32\text{ GHz}$ 内模块的线性增益最大可达 20.7 dB ；增益 1 dB 压缩点输出功率大于 10.0 dBm ；饱和输出功率可以达到 14.4 dBm ；模块总直流动功耗小于 90 mW 。本文设计的模块性能良好，适合应用于现代各类 Ka 波段通信系统之中。

学位
论文

长距离RFID系统的设计与实现_周洁

摘要

随着5G技术的不断成熟与发展，物联网(IOT)必将在5G时代大放异彩。随着物联网技术的快速发展，射频识别(Radio Frequency Identification, RFID)技术凭借其多目标准确快速识别的优势已得到越来越广泛的应用。随着无源超高频(Ultra-High Frequency, UHF)RFID系统应用领域的不断扩大，市场对长距离可靠通信、大规模标签无漏识别提出了迫切的需求，而限制通信距离的主要因素为前向链路，即受限于无源标签灵敏度。

本文针对传统无源UHF RFID标签识别距离不远的问题，在分析了系统能量传输过程后，分别从系统架构的创新、各模块硬件电路设计、软件设计三个方面展开了研究工作。

本文的主要研究工作及贡献如下：

1. 基于目前UHF RFID系统识别距离受限于标签芯片灵敏度这一现状，提出了读写器-转发器-标签三点式UHF RFID系统架构。解除了传统读写器-标签两点式架构中能量供给对距离的限制，将标签与读写器之间的通信距离提升了3倍，达到了 70 m 。
2. 通过前向链路与反向链路通信不同频，消除了传统读写器电路中存在的同频自干扰信号，提升了读写器的接收灵敏度。
3. 通过多中继组网、多天线协同覆盖，将大容量RFID标签蜂窝化，结合空分、时分、频分等信道利用资源利用效率提升技术，将单个读写器对标签的接入能力大幅提升。
4. 在硬件电路实现方面，设计了满足ISO/IEC18000-6C协议要求下的高性能的读写器和转发器硬件电路。
5. 在软件设计方面，完成了多转发器协同工作的自定义组网协议设计，以及读写器侧与转发器侧的嵌入式软件实现。

本文研究成果为长距离RFID系统实现提供了经济有效的解决方案，同时能满足大容量标签无漏识别的需求，有助于推动UHF RFID技术和蜂窝物联网的应用与发展。



课堂练习

- 请阅读这篇本科毕业设计论文的摘要

电子科技大学

UNIVERSITY OF ELECTRONIC SCIENCE AND TECHNOLOGY OF CHINA

学士学位论文 BACHELOR THESIS



论文题目 5G 用户定位方法研究

学 院 信息与通信工程学院

专 业 电子信息工程

学 号 2016000201004

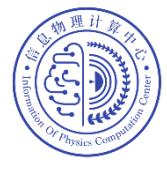
作者姓名 林静思

指导教师 武刚 教授

摘要

5G的多样化场景使得基于位置的服务（LBS）业务需求日益增长，对用户终端的准确定位也就越来越重要。同时，蜂窝网络的日益普及为用户设备本身位置的确定提供了帮助，且便于为移动通信系统自身业务提供位置服务，因此基于基站的观察到达时差（OTDOA）定位成为了用户终端定位研究的热点方向。

本文对5G用户定位方法展开研究，重点研究5G用户定位标准方法中基于OTDOA的定位方法。首先，介绍了基本定位技术，描述了5G无线接入网接入支持的标准用定位方法。其次，详细给出了基于OTDOA的用户终端定位过程，建立了基于OTDOA的双曲线定位模型。再次，采用均方根误差作为定位性能评价指标，在高斯白噪声信道环境下，利用CHAN算法和Taylor级数展开算法进行用户终端位置估计仿真测试，并讨论了不同基站个数、不同小区半径、不同测量噪声大小对各定位算法性能的影响。然后，基于COST259信道模型，研究了非视距（NLOS）误差对用户终端定位性能的影响。最后，根据非视距误差带来的定位偏差分析，利用一种迭代算法通过分层细化的方式对CHAN算法进行了改进，仿真结果表明，改进算法使得非视距环境下的定位性能显著提升。



2.6 文献阅读-期刊论文

期刊 论文

一个典型的期刊论文，都讲啥呢

- Abstract (摘要)
- Introduction (引言)
- Results (研究成果)
- Analysis (分析讨论)
- Conclusion (结论)
- Acknowledgement (致谢)
- References (参考文献)

应该先看，确认这篇论文是不是你关心的 topic

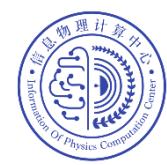
如果你是新手，建议仔细看，
想想别人是怎么引入主题的
而且，还可以进一步找到新的文献

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阅读方法：看图说话

简要的总结，
一般提炼了本文最有价值的东西



2.6 文献阅读-期刊论文



期刊
论文



Broadband gate-tunable terahertz plasmons in graphene heterostructures

Baicheng Yao^{1,2,*}, Yuan Liu^{3,4}, Shu-Wei Huang^{1,8}, Chanyeol Choi¹, Zhenda Xie^{1,9}, Jaime Flor Flores¹, Yu Wu², Mingbin Yu^{5,10}, Dim-Lee Kwong^{5,11}, Yu Huang^{1,3,4}, Yunjiang Rao², Xiangfeng Duan^{6,*} and Chee Wei Wong^{1*}

摘要 一般只要3分钟，就能在电子、机械和热传输领域，驱动由量子化Dirac fermions组成的层状石墨烯，实现线性色散。在这里，我们展示了差拍泵浦-光子差拍频率过程，以相干地生成和控制太赫兹等离子体，在原子层石墨烯中，具有八度可调性和高效率。我们利用石墨烯的内在表面不对称性，为强二阶非线性极化率提供了一种新的方法，即通过与紧密限制的太赫兹光场一起工作，从而实现极化率，从而实现一个稳健的差拍频率信号，以太赫兹频率为特征。差拍泵浦共振子过程在石墨烯中独特地实现了能量和动量的双重守恒。因此，我们展示了双层石墨烯异质结中的太赫兹电荷-电场耦合，以及八度带宽，仅通过光泵放大器光学带宽的泵浦。理论建模支持我们的单极-电压-带宽调谐，通过随机相位匹配测量，将带宽限制在4.7 THz内，与phonon耦合、饱和吸收和Landau阻尼相关的不同物理过程。

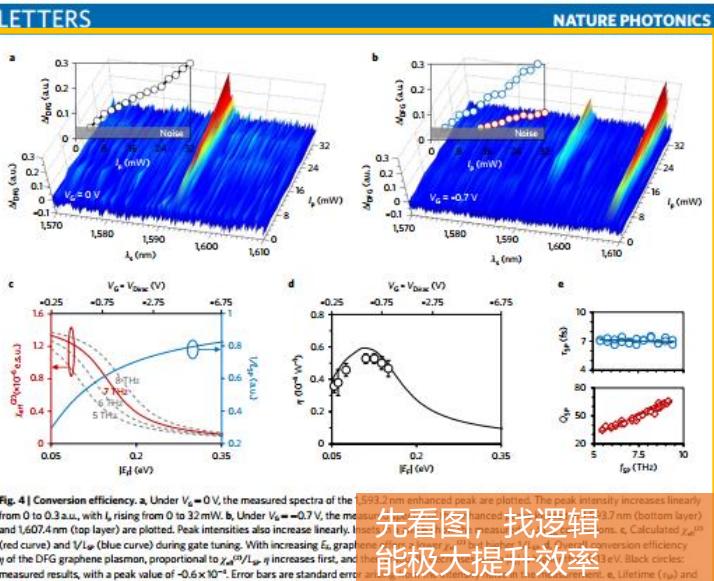
The discovery of graphene has spurred dramatic advances ranging from condensed matter physics and materials science to signal electronics, mechanics and thermal processes. In optics⁴, the additional chiral symmetry of the Dirac fermion quasiparticle of graphene enables optical conductivity defined only by the fine structure constant (α ref. ⁵), one that is remarkably charge density-tunable^{6–10} and with broadband nonlinearities^{11–13}. The collective oscillations of the two-dimensional correlated quasiparticles in graphene¹⁴ naturally make for a fascinating cross-disciplinary field in graphene plasmonics¹⁵, with applications ranging from light-field-enhanced modulators, detectors, lasers and polarizers to biochemical sensors^{16–20}. Unlike conventional noble metal plasmons, graphene plasmons are dominant in the terahertz an far-infrared frequencies²¹. To excite and detect these plasmons, specialized techniques such as resonant scattering nanoscale antenna

near-field microscopy or micro- and nanoscale scattering arrays have been pursued, albeit still using terahertz/far-infrared sources^{1–13}. Recently, nonlinear optical processes, only with free-space experiments, have proven especially effective in generating graphene plasmonics with efficiencies up to 10^{-4} (refs ¹⁴). However, it has been challenging to generate, detect and control on-chip graphene plasmonics all-optically, a key step ahead towards planar integration and next-generation high-density optoelectronics.

Terahertz generation has recently been revisited in a number of studies for imaging, spectroscopy and communications³⁹. Wide terahertz bandwidth can provide new grounds for broadband stand-off spectroscopy and wavelength-agile ultrahigh-bandwidth communications, but tunability in terahertz materials has been limited so far (Supplementary Table 1). Here, we demonstrate experimentally the charge- and gate-tunability of terahertz plasmons over an octave, from 4.7 THz to 9.4 THz, bounded only by the pump amplifier optical bandwidth. Through the surface asymmetry of dual-layer graphene and the right p polarization excitation, we achieve the first time-frequency coherent terahertz generation. We propose an integrated carrier-pumped resonant process for the time-matching over a octave of the full-scale terahertz carrier frequency. Our designed heterostructure achieves

widely tunable terahertz generation via gating at the single volt level, matching our conductivity models and numerical predictions.

Figure 3 shows the graphene-on-silicon-nitride waveguide (GSINW) architecture studied in this work. The GSINW has a bottom atomic layer of graphene connecting the drain and source contacts, a layer of alumina functioning as a thin dielectric barrier, and a second atomic layer of top graphene connecting the gate. The silicon nitride waveguide is 1 μ m wide and 725 nm in height, and the graphene-Al₂O₃-graphene hybrid heterostructure is assembled with direct contact to the nitride core, enabling effective light-graphene interaction along the ~80- μ m waveguide overlap region. The waveguide input-output regions are tapered for effective on/off-coupling. Details of the nanofabrication are provided in Supplementary Section 3. The graphene layers serve simultaneously



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normalizing the pump power, $\eta = (\chi_{ad}^{(2)}/L_{sp})^2$. For $f_p \approx f_i \gg f_{sp}$, η could be approximately written as

$$\eta = \frac{e^3}{2\pi^3 h^2 k_{SP} \sqrt{f_{EP}}} \left[\frac{\pi}{2} + \arctan \left(\frac{2\pi \sqrt{f_{EP}} - 2V_P \sqrt{2m_V E_F}}{\gamma} \right) \right] \arctan \left(\frac{E_F}{\epsilon_F} \right) \quad (6)$$

where m_e is the electron rest mass, γ is the scattering rate, \hbar is the reduced Planck's constant and v_F is the Fermi velocity at -10^5 m s^{-1} . In the GSIN, $L_{\text{g}}^{(0)}$ and $L_{\text{ILS}}^{(0)}$ are of opposite trend: when $E_0 = 0$, graphene has the largest $L_{\text{g}}^{(0)}$, however, its carrier density is minimal and $L_{\text{g}} \rightarrow \infty$, and the graphene plasmon is completely damped. When E_0 is high, due to the high carrier density, $L_{\text{g}}^{(0)}$ could be low, but $L_{\text{ILS}}^{(0)}$ approaches 0. As a balanced trade-off, with increasing Fermi level, η rises first and then drops gradually when $E_0 > 130 \text{ meV}$. This means, by selecting a proper $|V_G - V_{\text{bias}}| \approx 0.5 \text{ V}$ to ensure $E_0 \approx 130 \text{ meV}$, we can find a highest $\eta \approx 6 \times 10^{-5} \text{ W}^{-1}$. Under a tuned E_0 , η of the bottom and top graphene layers can indeed be degenerate.

In this Letter, by using counter-pumped $\chi^{(3)}$ DFG, we demonstrate terahertz plasmon generation and control in chip-scale integrated graphene. With a dual-layer graphene heterostructure, our counter-pumped configuration enables phase and frequency matching, with

DFG signal detection through lock-in and balanced detection. Coherent DFG excitation is gate-tunable for both graphene layers, with symmetric-antisymmetric frequency crossing between the two and with tunability from 4.7 to 9.4 THz, a tunability over an ϵ . Under positive and negative gate voltages, we observe the plasmon dispersion frequencies exchange between the top and bottom layers, with a linewidth quality factor that increases slightly up to ~ 60 . The optimal planar terahertz plasmon generation approach reaches 10^{-4} W when the Fermi level is 0.13 eV, drawing a trade-off with larger ϵ^3 but larger plasmon loss from phonon heating (L_ϕ) with smaller F_p . These observations on chip-scale graphene terahertz plasmon generation and control open a new architectural platform for widely tunable terahertz sources, gate-tunable plasmon dispersion, and applications in optoelectronics.

Remembering conclusions can improve memory performance, especially when data availability and any associated preferences are available at <https://doi.org/10.1111/jcpp.12459>.
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REVIEW

Deep learning

Yann LeCun^{1,2}, Yoshua Bengio³ & Geoffrey Hinton^{4,5}

Deep learning allows computational models that are composed of multiple processing layers to learn representations of data with multiple levels of abstraction. These methods have dramatically improved the state-of-the-art in speech recognition, visual object recognition, object detection and many other domains such as drug discovery and genomics. Deep learning discovers intricate structure in large data sets by using the backpropagation algorithm to indicate how a machine should change its internal parameters that are used to compute the representation in each layer from the representation in the previous layer. Deep convolutional nets have brought about breakthroughs in processing images, video, speech and audio, whereas recurrent nets have shone light on sequential data such as text and speech.

Machine-learning technology powers many aspects of modern society: from web searches to content filtering on social networks to recommendations on e-commerce websites, and it is increasingly present in consumer products such as cameras and smartphones. Machine-learning systems are used to identify objects in images, transcribe speech into text, match news items, posts or products with users' interests, and select relevant results of search. Increasingly, these applications make use of a class of techniques called deep learning.

Conventional machine-learning techniques were limited in their ability to process natural data in their raw form. For decades, constructing a pattern-recognition or machine-learning system required careful engineering and considerable domain expertise to design a feature extractor that transformed the raw data (such as the pixel values of an image) into a suitable internal representation or feature vector from which the learning subsystem, often a classifier, could detect or classify patterns in the input.

Representation learning is a set of methods that allows a machine to be fed with raw data and to automatically discover the representations needed for detection or classification. Deep-learning methods are representation-learning methods with multiple levels of representation, obtained by composing simple but non-linear modules that each transform the representation at one level (starting with the raw input) into a representation at a higher, slightly more abstract level. With the composition of enough such transformations, very complex functions can be learned. For classification tasks, higher layers of representation amplify aspects of the input that are important for discrimination and suppress irrelevant variations. An image, for example, comes in the form of an array of pixel values, and the learned features in the first layer of representation typically represent the presence or absence of edges at particular orientations and locations in the image. The second layer typically detects motifs by spotting particular arrangements of edges, regardless of small variations in the edge positions. The third layer may assemble motifs into larger combinations that correspond to parts of familiar objects, and subsequent layers would detect objects as combinations of these parts. The key aspect of deep learning is that these layers of features are not designed by human engineers: they are learned from data using a general-purpose learning procedure.

Deep learning is making major advances in solving problems that have resisted the best attempts of the artificial intelligence community for many years. It has turned out to be very good at discovering

intricate structures in high-dimensional data and is therefore applicable to many domains of science, business and government. In addition to beating records in image recognition^{1–4} and speech recognition^{5–7}, it has beaten other machine-learning techniques at predicting the activity of potential drug molecules⁸, analysing particle accelerator data⁹, reconstructing brain circuits¹⁰, and predicting the effects of mutations in non-coding DNA on gene expression and disease^{11,12}. Perhaps more surprisingly, deep learning has produced extremely promising results for various tasks in natural language understanding¹³, particularly topic classification, sentiment analysis, question answering¹⁴ and language translation^{16,17}.

We think that deep learning will have many more successes in the near future because it requires very little engineering by hand, so it can easily take advantage of increases in the amount of available computation and data. New learning algorithms and architectures that are currently being developed for deep neural networks will only accelerate this progress.

Supervised learning

The most common form of machine learning, deep or not, is supervised learning. Imagine that we want to build a system that can classify images as containing, say, a house, a car, a person or a pet. We first collect a large data set of images of houses, cars, people and pets, each labelled with its category. During training, the machine is shown an image and produces an output in the form of a vector of scores, one for each category. We want the desired category to have the highest score of all categories, but this is unlikely to happen before training. We compute an objective function that measures the error (or distance) between the output scores and the desired pattern of scores. The machine then modifies its internal adjustable parameters to reduce this error. These adjustable parameters, often called weights, are real numbers that can be seen as 'knobs' that define the input-output function of the machine. In a typical deep-learning system, there may be hundreds of millions of these adjustable weights, and hundreds of millions of labelled examples with which to train the machine.

To properly adjust the weight vector, the learning algorithm computes a gradient vector that, for each weight, indicates by what amount the error would increase or decrease if the weight were increased by a tiny amount. The weight vector is then adjusted in the opposite direction to the gradient vector.

The objective function, averaged over all the training examples, can

be seen as a kind of hilly landscape in the high-dimensional space of weight values. The negative gradient vector indicates the direction of steepest descent in this landscape, taking it closer to a minimum, where the output error is low on average.

In practice, most practitioners use a procedure called stochastic gradient descent (SGD). This consists of showing the input vector for a few examples, computing the outputs and the errors, computing the average gradient for those examples, and adjusting the weights accordingly. The process is repeated for many small sets of examples from the training set until the average of the objective function stops decreasing. It is called stochastic because each small set of examples gives a noisy estimate of the average gradient over all examples. This simple procedure usually finds a good set of weights surprisingly quickly when compared with far more elaborate optimization techniques¹⁸. After training, the performance of the system is measured on a different set of examples called a test set. This serves to test the generalization ability of the machine — its ability to produce sensible answers on new inputs that it has never seen during training.

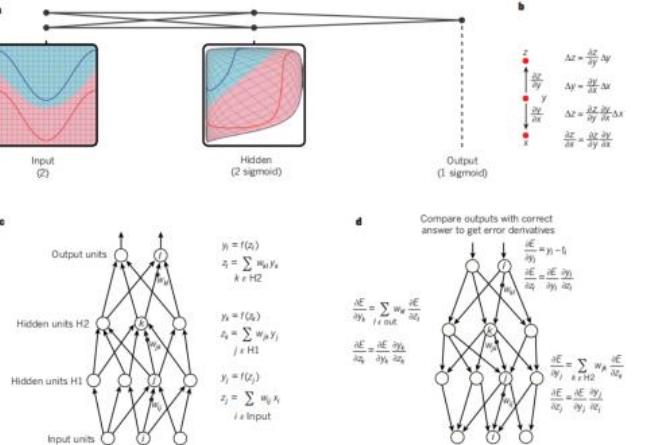


Figure 1 | Multilayer neural networks and backpropagation. **a**, A multi-layer neural network (shown by the connected dots) can distort the input space to make the classes of data (examples of which are the red and blue lines) linearly separable. Note how a regular grid (shown on the left) in input space is also transformed (shown in the middle right) into hidden units. This is an illustrative example with only two input units, two hidden units and one output unit, but the networks used for object recognition or natural language processing contain tens or hundreds of thousands of units. Reproduced with permission from C. Olah (<http://colah.github.io/>). **b**, The chain rule of derivatives tells us how two small effects (that of a small change Δx in x on y , and that of y on z) are composed. A small change Δx in x gets transformed first into a small change Δy in y by getting multiplied by $\partial y / \partial x$ (that is, the definition of partial derivative). Similarly, the change Δy creates a change Δz in z . Substituting one equation into the other gives the chain rule of derivatives — how Δx gets turned into Δz through multiplication by the product of $\partial y / \partial x$ and $\partial z / \partial y$. It also works when x , y and z are vectors (and the derivatives are Jacobian matrices). **c**, The equations used for computing the forward pass in a neural net with two hidden layers and one output layer, each constituting a module through

which one can backpropagate gradients. At each layer, we first compute the total input to each unit, which is a weighted sum of the outputs of the units in the layer below. Then a non-linear function $f(z)$ is applied to z to get the output of the unit. For simplicity, we have omitted bias terms.

The non-linear functions used in neural networks include the rectified linear unit (ReLU) $f(z) = \max(0, z)$, commonly used in recent years, as well as the more conventional sigmoid, such as the hyperbolic tangent, $f(z) = (\exp(z) - \exp(-z)) / (\exp(z) + \exp(-z))$ and logistic function logistic, $f(z) = 1 / (1 + \exp(-z))$. **d**, The equations used for computing the backward pass. At each hidden layer we compute the error derivative with respect to the output of each unit, which is a weighted sum of the error derivatives with respect to the total inputs to the units in the layer above. We then convert the error derivative with respect to the output into the error derivative with respect to the input by multiplying it by the gradient of $f(z)$. At the output layer, the error derivative with respect to the output of a unit is computed by differentiating the cost function. This gives $y_j - t_j$ if the cost function for unit j is $0.5(y_j - t_j)^2$, where t_j is the target value. Once the $\partial E / \partial z_i$ is known, the error-derivative for the weight w_{jk} on the connection from unit j in the layer below is just $y_j \partial E / \partial z_i$.

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Samoyed (16); Papillon (5.7); Pomeranian (2.7); Arctic fox (1.0); Eskimo dog (0.6); white wolf (0.6); Siberian husky (0.4)

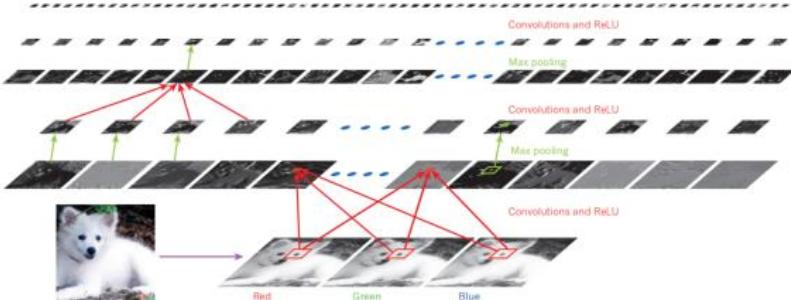


Figure 2 | Inside a convolutional network. The outputs (not filters) of each layer (horizontally) of a typical convolutional network architecture applied to the image of a Samoyed dog (bottom left); and RGB (red, green, blue) inputs, bottom right). Each rectangular image is a feature map

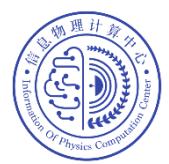
corresponding to the output for one of the learned features, detected at each of the image positions. Information flows bottom up, with lower-level features acting as oriented edge detectors, and a score is computed for each image class in output. ReLU, rectified linear unit.

raw pixels could not possibly distinguish the latter two, while putting the former two in the same category. This is why shallow classifiers require a good feature extractor that solves the selectivity-invariance dilemma — one that produces representations that are selective to the aspects of the image that are important for discrimination, but that are invariant to irrelevant aspects such as the pose of the animal. To make classifiers more powerful, one can use generic non-linear features, as with kernel methods²⁰, but generic features such as those arising with the Gaussian kernel do not allow the learner to generalize well far from the training examples²¹. The conventional option is to hand design good feature extractors, which requires a considerable amount of engineering skill and domain expertise. But this can all be avoided if good features can be learned automatically using a general-purpose learning procedure. This is the key advantage of deep learning.

Many applications of deep learning use feedforward neural network architectures (Fig. 1), which learn to map a fixed-size input (for example, an image) to a fixed-size output (for example, a probability for each of several categories). To go from one layer to the next, a set of units compute a weighted sum of their inputs from the previous layer and pass the result through a non-linear function. At present, the most popular non-linear function is the rectified linear unit (ReLU), which is simply the half-wave rectifier $f(z) = \max(0, z)$. In past decades, neural nets used smoother non-linearities, such as $\tanh(z)$ or $1/(1 + \exp(-z))$, but the ReLU typically learns much faster in networks with many layers, allowing training of a deep supervised network without unsupervised pre-training²². Units that are not in the input or output layer are conventionally called hidden units. The hidden layers can be seen as distorting the input in a non-linear way so that categories become linearly separable by the last layer (Fig. 1).

In the late 1990s, neural nets and backpropagation were largely forsaken by the machine-learning community and ignored by the computer-vision and speech-recognition communities. It was widely thought that learning useful, multistage, feature extractors with little prior knowledge was infeasible. In particular, it was commonly thought that simple gradient descent would get trapped in poor local minima — weight configurations for which no small change would reduce the average error.

In practice, poor local minima are rarely a problem with large networks. Regardless of the initial conditions, the system nearly always reaches solutions of very similar quality. Recent theoretical and empirical results strongly suggest that local minima are not a serious issue in general. Instead, the landscape is packed with a combinatorially large number of saddle points where the gradient is zero, and the surface curves up in most dimensions and curves down in the



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remainder^{28,30}. The analysis seems to show that saddle points with only a few downward curving directions are present in very large numbers, but almost all of them have very similar values of the objective function. Hence, it does not much matter which of these saddle points the algorithm gets stuck at.

Interest in deep feedforward networks was revived around 2006 (refs 31–34) by a group of researchers brought together by the Canadian Institute for Advanced Research (CIFAR). The researchers introduced unsupervised learning procedures that could create layers of feature detectors without requiring labelled data. The objective learning each layer of feature detectors was to be able to reconstruct or model the activities of feature detectors (or raw inputs) in the layer below. By 'pre-training' several layers of progressively more complex feature detectors using this reconstruction objective, the weights of a deep network could be initialized to sensible values. A final layer of output units could then be added to the top of the network and the whole deep system could be fine-tuned using standard backpropagation^{35–37}. This worked remarkably well for recognizing handwritten digits or for detecting pedestrians, especially when the amount of labelled data was very limited³⁸.

The first major application of this pre-training approach was in speech recognition, and it was made possible by the advent of fast graphics processing units (GPUs) that were convenient to program³⁷ and allowed researchers to train networks 10 or 20 times faster. In 2009, the approach was used to map short temporal windows of coefficients extracted from a sound wave to a set of probabilities for the various fragments of speech that might be represented by the frame in the center of the window. It achieved record-breaking results on a standard speech recognition benchmark that used a small vocabulary³⁹ and was quickly developed to give record-breaking results on a large vocabulary task⁴⁰. By 2012, versions of the deep net from 2009 were being developed by many of the major speech groups⁴¹ and were already being deployed in Android phones. For smaller data sets, unsupervised pre-training helps to prevent overfitting⁴², leading to significantly better generalization when the number of labelled examples is small, or in a transfer setting where we have lots of examples for some 'source' tasks but very few for some 'target' tasks. Once deep learning had been rehabilitated, it turned out that the pre-training stage was only needed for small data sets.

There was, however, one particular type of deep, feedforward network that was much easier to train and generalized much better than networks with full connectivity between adjacent layers. This was the convolutional neural network (ConvNet)^{42,43}. It achieved many practical successes during the period when neural networks were out of favour and it has recently been widely adopted by the computer-vision community.

Convolutional neural networks

ConvNets are designed to process data that come in the form of multiple arrays, for example a colour image composed of three 2D arrays containing pixel intensities in the three colour channels. Many data modalities are in the form of multiple arrays: 1D for signals and sequences, including language; 2D for images or audio spectrograms; and 3D for video or volumetric images. There are four key ideas behind ConvNets that take advantage of the properties of natural signals: local connections, shared weights, pooling and the use of layers.

Image understanding with deep convolutional networks Since the early 2000s, ConvNets have been applied with great success to the detection, segmentation and recognition of objects and regions in images. These were all tasks in which labelled data was relatively abundant, such as traffic sign recognition⁴⁴, the segmentation of biological images⁴⁵ particularly for connectomics⁴⁶, and the detection of faces, text, pedestrians and human bodies in natural images^{47,48,49,50,51,52,53}. A major recent practical success of ConvNets is face recognition⁴⁹.

Importantly, images can be labelled at the pixel level, which will have applications in technology, including autonomous mobile robots and

this architecture is twofold. First, in array data such as images, local groups of values are often highly correlated, forming distinctive local motifs that are easily detected. Second, the local statistics of images and other signals are invariant to location. In other words, if a motif can appear in one part of the image, it could appear anywhere, hence the idea of units at different locations sharing the same weights and detecting the same pattern in different parts of the array. Mathematically, the filtering operation performed by a feature map is a discrete convolution, hence the name.

Although the role of the convolutional layer is to detect local junctions of features from the previous layer, the role of the pooling layer is to merge semantically similar features into one. Because the relative positions of the features forming a motif can vary somewhat, reliably detecting the motif can be done by coarse-graining the position of each feature. A typical pooling unit computes the maximum of a local patch of units in one feature map (or in a few feature maps). Neighbouring pooling units take input from patches that are shifted by more than one row or column, thereby reducing the dimension of the representation and creating an invariance to small shifts and distortions. Two or three stages of convolution, non-linearity and pooling are stacked, followed by more convolutional and fully-connected layers. Backpropagating gradients through a ConvNet is as simple as through a regular deep network, allowing all the weights in all the filter banks to be trained.

Deep neural networks exploit the property that many natural signals are compositional hierarchies, in which higher-level features are obtained by composing lower-level ones. In images, local combinations of edges form motifs, motifs assemble into parts, and parts form objects. Similar hierarchies exist in speech and text from sounds to phones, phonemes, syllables, words and sentences. The pooling allows representations to vary very little when elements in the previous layer vary in position and appearance.

The convolutional and pooling layers in ConvNets are directly inspired by the classic notions of simple cells and complex cells in visual neuroscience⁴¹, and the overall architecture is reminiscent of the LGN-V1-V2-V4-IT hierarchy in the visual cortex ventral pathway⁴⁶. When ConvNet models and monkeys are shown the same picture, the activations of high-level units in the ConvNet explains half of the variance of random sets of 160 neurons in the monkey's inferotemporal cortex⁴⁵. ConvNets have their roots in the neocognitron⁴⁶, the architecture of which was somewhat similar, but did not have an end-to-end supervised-learning algorithm such as backpropagation. A primitive 1D ConvNet called a time-delay neural net was used for the recognition of phonemes and simple words^{47,48}.

There have been numerous applications of convolutional networks going back to the early 1990s, starting with time-delay neural networks for speech recognition⁴⁹ and document reading⁵⁰. The document reading system used a ConvNet trained jointly with a probabilistic model that implemented language constraints. By the late 1990s this system was reading over 10% of all the cheques in the United States. A number of ConvNet-based optical character recognition and handwriting recognition systems were later deployed by Microsoft⁵¹. ConvNets were also experimented with in the early 1990s for object detection in neural images, including faces and hands^{52,53}, and for face recognition⁵².

Recent ConvNet architectures have 10 to 20 layers of ReLUs, hundreds of millions of weights, and billions of connections between units. Whereas training such large networks could have taken weeks only two years ago, progress in hardware, software and algorithm parallelization have reduced training times to a few hours.

The performance of ConvNet-based vision systems has caused most major technology companies, including Google, Facebook,

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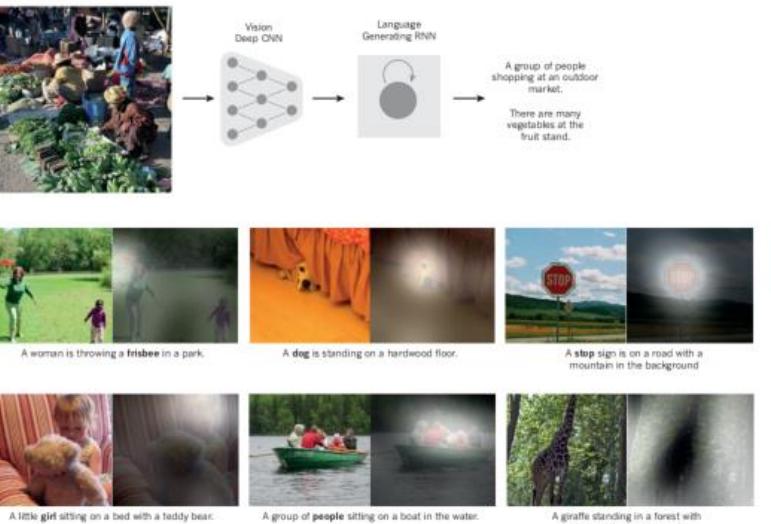


Figure 3 | From image to text. Captions generated by a recurrent neural network (RNN) taking, as extra input, the representation extracted by a deep convolutional neural network (CNN) from a test image, with the RNN trained to 'translate' high-level representations of images into captions (top). Reproduced with permission from ref. 102. When the RNN is given the ability to focus its attention on a different location in the input image (middle and bottom; the lighter patches were given more attention) as it generates each word (bold), we found⁴⁹ that it exploits this to achieve better 'translation' of images into captions.

Microsoft, IBM, Yahoo!, Twitter and Adobe, as well as a quickly growing number of start-ups to initiate research and development projects and to deploy ConvNet-based image understanding products and services.

Despite these successes, ConvNets were largely forsaken by the mainstream computer-vision and machine-learning communities until the ImageNet competition in 2012. When deep convolutional networks were applied to a data set of about a million images from the web that contained 1,000 different classes, they achieved spectacular results, almost halving the error rates of the best competing approaches⁴³. This success came from the efficient use of GPUs, ReLUs, a new regularization technique called dropout⁵², and techniques to generate more training examples by deforming the existing ones. This success has brought about a revolution in computer vision; ConvNets are now the dominant approach for almost all recognition and detection tasks^{4,14,38,44–46} and approach human performance on some tasks. A recent stunning demonstration combines ConvNets and recurrent net modules for the generation of image captions⁴⁹.

Distributed representations and language processing Deep-learning theory shows that deep nets have two different exponential advantages over classic learning algorithms that do not use distributed representations²¹. Both of these advantages arise from the power of composition and depend on the underlying data-generating distribution having an appropriate componential structure²¹. First, learning distributed representations enable generalization to new combinations of the values of learned features beyond those seen during training (for example, 2ⁿ combinations are possible with n binary features)^{49,50}. Second, composing layers of representation in a deep net brings the potential for another exponential advantage²⁹ (exponential in the depth).

The hidden layers of a multilayer neural network learn to represent the network's inputs in a way that makes it easy to predict the target outputs. This is nicely demonstrated by training a multilayer neural network to predict the next word in a sequence from a local

context of earlier words²¹. Each word in the context is presented to the network as a one-of-N vector; that is, one component has a value of 1 and the rest are 0. In the first layer, each word creates a different pattern of activations, or word vectors (Fig. 4). In a language model, the other layers of the network learn to convert the input word vectors into an output word vector for the predicted next word, which can be used to predict the probability for any word in the vocabulary to appear as the next word. The network learns word vectors that contain many active components each of which can be interpreted as a separate feature of the word, as was first demonstrated²¹ in the context of learning distributed representations for symbols. These semantic features were not explicitly present in the input. They were discovered by the learning procedure as a good way of factorizing the structure relationships between the input and output symbols into multiple 'micro-rules'. Learning word vectors turned out to also work very well when the word sequences come from a large corpus of real text and the individual micro-rules are unreliable²¹. When trained to predict the next word in a news story, for example, the learned word vectors for Tuesday and Wednesday are very similar, as are the word vectors for Sweden and Norway. Such representations are called distributed representations because their elements (the features) are not mutually exclusive and their many configurations correspond to the variations seen in the observed data. These word vectors are composed of learned features that were not determined ahead of time by experts, but automatically discovered by the neural network. Vector representations of words learned from text are now very widely used in natural language applications^{14,17,23–26}.

RNNs are very powerful dynamic systems, but training them has proved to be problematic because the backpropagated gradients either grow or shrink at each time step, so over many time steps they typically explode or vanish^{47,51}. Thanks to advances in their architecture^{48,49} and ways of training them^{41,42}, RNNs have been found to be very good at predicting the next character in the text⁴⁹ or the next word in a sequence²¹, but they can also be used for more complex tasks. For example, after reading an English sentence one word at a time, an English 'encoder' network can be trained so that the final state vector of its hidden units is a good representation of the thought expressed by the sentence. This thought vector can then be used as the initial hidden state of (or as extra input to) a jointly trained French 'decoder' network, which outputs a probability distribution for the first word of the French translation. If a particular first word is chosen from this distribution and provided as input to the decoder network it will then output a probability distribution for the second word of the translation and so on until a full stop is chosen^{47,52}. Overall, this process generates sequences that depends on French words according to a probability distribution that depends on the English sentence. This rather naive way of performing machine translation has quickly become competitive with the state-of-the-art, and this raises serious doubts about whether understanding a sentence requires anything like the internal symbolic expressions that are manipulated by using inference rules. It is more compatible with the view that everyday reasoning involves many simultaneous analogies

handful of words would require very large training corpora. N-grams treat each word as an atomic unit, so they cannot generalise across semantically related sequences of words, whereas neural language models can because they associate each word with a vector of real valued features, and semantically related words end up close to each other in that vector space (Fig. 4).

Recurrent neural networks

When backpropagation was first introduced, its most exciting use was for training recurrent neural networks (RNNs). For tasks that involve sequential inputs, such as speech and language, it is often better to use RNNs (Fig. 5). RNNs process an input sequence one element at a time, maintaining in their hidden units a 'state vector' that implicitly contains information about the history of all the past elements of the sequence. When we consider the outputs of the hidden units at different discrete time steps as if they were the outputs of different neurons in a deep multilayer network (Fig. 5, right), it becomes clear how we can apply backpropagation to train RNNs.

RNNs are very powerful dynamic systems, but training them has proved to be problematic because the backpropagated gradients either grow or shrink at each time step, so over many time steps they typically explode or vanish^{47,51}.

Thanks to advances in their architecture^{48,49} and ways of training them^{41,42}, RNNs have been found to be very good at predicting the next character in the text⁴⁹ or the next word in a sequence²¹, but they can also be used for more complex tasks. For example, after reading an English sentence one word at a time, an English 'encoder' network can be trained so that the final state vector of its hidden units is a good representation of the thought expressed by the sentence. This thought vector can then be used as the initial hidden state of (or as extra input to) a jointly trained French 'decoder' network, which outputs a probability distribution for the first word of the French translation. If a particular first word is chosen from this distribution and provided as input to the decoder network it will then output a probability distribution for the second word of the translation and so on until a full stop is chosen^{47,52}. Overall, this process generates sequences that depends on French words according to a probability distribution that depends on the English sentence. This rather naive way of performing machine translation has quickly become competitive with the state-of-the-art, and this raises serious doubts about whether understanding a sentence requires anything like the internal symbolic expressions that are manipulated by using inference rules. It is more compatible with the view that everyday reasoning involves many simultaneous analogies



Figure 4 | Visualizing the learned word vectors. On the left is an illustration of word representations learned for modelling language, non-linearly projected to 2D for visualization using the t-SNE algorithm⁵³. On the right is a 2D representation of phrases learned by an English-to-French encoder-decoder recurrent neural network²¹. One can observe that semantically similar words



2.6 文献阅读



Figure 5 | A recurrent neural network and the unfolding in time of the computation involved in its forward computation. The artificial neurons (for example, hidden units grouped under node s_i with values s_i at time t) get inputs from other neurons at previous time steps (this is represented with the black square, representing a delay of one time step, on the left). In this way, a recurrent neural network can map an input sequence with elements x_i into an output sequence with elements y_i , with each y_i depending on all the previous x_j (for $j \leq t$). The same parameters (matrices U , V , W) are used at each time step. Many other architectures are possible, including a variant in which the network can generate a sequence of outputs (for example, words), each of which is used as inputs for the next time step. The backpropagation algorithm (Fig. 1) can be directly applied to the computational graph of the unfolded network on the right, to compute the derivative of a total error (for example, the log-probability of generating the right sequence of outputs) with respect to all the states s_i and all the parameters.

that each contribute plausibility to a conclusion^{84,85}.

Instead of translating the meaning of a French sentence into an English sentence, one can learn to ‘translate’ the meaning of an image into an English sentence (Fig. 3). The encoder here is a deep ConvNet that converts the pixels into an activity vector in its last hidden layer. The decoder is an RNN similar to the ones used for machine translation and neural language modelling. There has been a surge of interest in such systems recently (see examples mentioned in ref. 86).

RNNs, once unfolded in time (Fig. 5), can be seen as very deep feedforward networks in which all the layers share the same weights. Although their main purpose is to learn long-term dependencies, theoretical and empirical evidence shows that it is difficult to learn to store information for very long⁸⁷.

To correct for that, one idea is to augment the network with an explicit memory. The first proposal of this kind is the long short-term memory (LSTM) networks that use special hidden units, the natural behaviour of which is to remember inputs for a long time⁸⁸. A special unit called the memory cell acts like an accumulator or a gated leaky neuron: it has a connection to itself at the next time step that has a weight of one, so it copies its own real-valued state and accumulates the external signal, but this self-connection is multiplicatively gated by another unit that learns to decide when to clear the content of the memory.

LSTM networks have subsequently proved to be more effective than conventional RNNs, especially when they have several layers for each time step⁸⁷, enabling an entire speech recognition system that goes all the way from acoustics to the sequence of characters in the transcription. LSTM networks or related forms of gated units are also currently used for the encoder and decoder networks that perform so well at machine translation^{17,72,76}.

Over the past year, several authors have made different proposals to augment RNNs with a memory module. Proposals include the Neural Turing Machine in which the network is augmented by a ‘tape-like’ memory that the RNN can choose to read from or write to⁸⁹, and memory networks, in which a regular network is augmented by a kind of associative memory⁹⁰. Memory networks have yielded excellent performance on standard question-answering benchmarks. The memory is used to remember the story about which the network is later asked to answer questions.

Beyond simple memorization, neural Turing machines and memory networks are being used for tasks that would normally require reasoning and symbol manipulation. Neural Turing machines can be taught ‘algorithms’. Among other things, they can learn to output

sorted sets of symbols when their input consists of an unsorted sequence, in which each symbol is accompanied by a real value that indicates its position in the list⁹¹. Memory networks can be trained to keep track of the state of the world in a setting similar to a text adventure game and after reading a story, they can answer questions that require complex inference⁹². In one test example, the network is shown a 15-sentence version of *The Lord of the Rings* and correctly answers questions such as ‘where is Frodo now?’⁹³.

The future of deep learning

Unsupervised learning^{91–98} has had a catalytic effect in reviving interest in deep learning, but has since been overshadowed by the successes of purely supervised learning. Although we have not focused on it in this Review, we expect unsupervised learning to become far more important the longer term. Human and animal learning is largely unsupervised: we discover the structure of the world by observing it, not by being told the name of every object.

Human vision is an active process that sequentially samples the optic array in an intelligent, task-specific way using a small, high-resolution fovea with a large, low-resolution surround. We expect much of the future progress in vision to come from systems that are trained end-to-end and combine ConvNets with RNNs that use reinforcement learning to decide where to look. Systems combining deep learning and reinforcement learning are in their infancy, but they already outperform passive vision systems⁹⁹ at classification tasks and produce impressive results in learning to play many different video games¹⁰⁰.

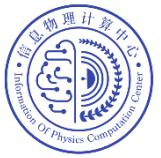
Natural language understanding is another area in which deep learning is poised to make a large impact over the next few years. We expect systems that use RNNs to understand sentences or whole documents will become much better when they learn strategies for selectively attending to one part at a time^{101,102}.

Ultimately, major progress in artificial intelligence will come about through systems that combine representation learning with complex reasoning. Although deep learning and simple reasoning have been used for speech and handwriting recognition for a long time, new paradigms are needed to replace rule-based manipulation of symbolic expressions by operations on large vectors¹⁰³. ■

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2.6 文献阅读-专利

专利

一个典型的专利提纲，都讲啥呢

- **发明摘要**
- **权利要求书**
- **说明书具体内容**
- **实施案例举例。。**
- **附图**

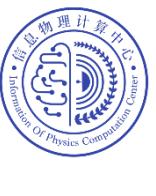
权力要求书

1. 一种基于石墨烯奇异点的回音壁微球腔单分子氮气气体传感器，其特征在于，由一个单模光纤经过电弧3次放电形成的二氧化硅微球，两个喷镀的金电极，一片化学气相沉积制备的石墨烯单层薄膜，和一段用于耦合的微纳光纤组成，其中两个金电极分布在微球的顶部和底部，其间由石墨烯连接，微纳光纤与微球赤道贴附耦合用以输入和输出信号。+

2. 根据权利要求1所述的一种基于石墨烯奇异点的回音壁微球腔单分子氮气气体传感器，其特征在于，二氧化硅微球的直径为280微米，腔品质因数为3千万，金电极的厚度为30纳米，形状为半球形，贴合球面，分布在微球的顶部和底部，中间赤道部分留出100微米宽的空间。单层石墨烯薄膜厚度0.38纳米，长120微米，宽80微米，覆盖在微球赤道区域，并连接上下两个金电极，用于耦合的微纳光纤由二氧化硅单模光纤通过熔融拉锥方法制备而成，直径为2微米，长度为3~5厘米。+

3. 根据权利要求1所述的一种基于石墨烯奇异点的回音壁微球腔单分子氮气气体传感器，其特征在于，通过在石墨烯上施加外加电压让谐振腔进入简并奇异点，施加的外电压为26伏特，奇异点位置为1556.832纳米。+

4. 根据权利要求1所述的一种基于石墨烯奇异点的回音壁微球腔单分子氮气气体传感器，其特征在于，在奇异点附近输出功率为70纳瓦，对氮气分子的传感灵敏度为530kHz/分子。.....分节符(下一页).....



2.6 文献阅读-专利

总结一下

- **抓核心:** 找目的, 贴标签
- **讲效率:** 重概念, 泛分析
- **再精读:** 仔细把握内在逻辑与科学技术要点
- **回头想:** 这篇文献能帮助我干点什么



2.7 文献综述撰写

每组需要撰写一份综述！！！！

在此之前，有必要告诉大家该怎么写。

一方面全面梳理综述写作基本技能。

一方面也怕你们写的东西辣眼睛。



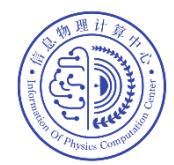
毕业时动情地说：
老师您辛苦了！
老师说：遇到你这样的，
不是辛苦，是命苦！



网络真是伟大的发明
以前写作业要翻好多书
现在只要上上网
就能彻底把写作业忘了



综述选题



组号	组长	组员1	组员2	组员3	组员4	选题题目
1						
2						
3						
4						
5						
6						



2.7 文献综述撰写

什么是综述报告

REVIEW

Hall of Fame Article

Broadband Metamaterial Absorbers

Peng Yu, Lucas V. Besteiro, Yongjun Huang, Jiang Wu, Lan Fu, Hark H. Tan, Chennupati Jagadish, Gary P. Wiederrecht, Alexander O. Govorov,* and Zhiming Wang*

The recent rise of metamaterials opens new opportunities for absorbers due to their designed electrodynamic properties and effects, allowing the creation of materials with effective values of permittivity and permeability that are not available in naturally occurring materials. Since their first experimental demonstration in 2008, recent literature has offered great advances in metamaterial perfect absorbers (MMAs) operating at frequencies from radio to optical. Broadband absorbers are indispensable in thermophotovoltaics, photodetection, bolometry, and manipulation of mechanical resonances. Although it is easy to obtain MMAs with single band or multiband, achieving broadband MMA (BMMMA) remains a challenge due to the intrinsically narrow bandwidth of surface plasmon polaritons, localized surface plasmon resonances generated on metallic surfaces at nanoscale or high Q-factor in GHz region.



Check for updates

报道某领域综合进展的文献

一般不需要原创研究

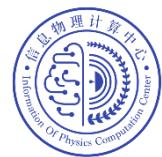
注重体系性总结

为科研工作者们提供一揽子的参考



课堂练习

- 快速阅读一篇中文综述
- 请总结其逻辑结构



5G 安全技术研究与标准进展

强奇¹, 武刚^{1*}, 黄开枝^{2*}, 胡苏¹, 李少谦¹

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2. 国家数字交换系统工程技术研究中心, 郑州 450002

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收稿日期: 2020-07-23; 接受日期: 2020-09-21; 网络出版日期: 2021-02-24

电子科技大学通信抗干扰技术国家级重点实验室稳定支持科研项目(批准号: IFN2020207)和四川省重点研发项目(编号: 2020YFG0315)资助

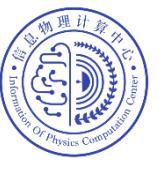
摘要 随着第五代移动通信系统(5th generation wireless systems, 5G)及其演进系统的商用和其在物联网、车联网等垂直领域的融合发展, 其安全问题越来越受到关注。本文从潜在威胁、安全架构和安全技术3个方面阐述了相关研究进展。首先, 根据攻击者对系统有效性、信息完整性、身份认证、隐私和机密性保护的不同安全目标, 将5G潜在的安全威胁进行了分类, 分析了各个层次可能面临的威胁与攻击手段。其次, 简述了相关标准中的5G安全架构, 讨论了5G及其演进系统潜在的物理层、网络层和应用层安全技术。最后, 本文指出了未来继续提升5G及B5G安全的潜在研究方向。

关键词 5G 安全, 5G 演进, 系统架构, 安全威胁, 物理层安全

1 背景介绍

随着5G(5th generation wireless systems)的逐步商用及其演进系统(beyond 5G, B5G)标准制订, 其安全问题越来越多地受到人们的关注。国际标准化组织第三代合作伙伴计划(3rd generation partnership project, 3GPP)在技术规范中定义了70多种5G的需求, 主要可分为3种场景, 即增强移动宽带、海量机器类通信和超可靠低时延通信^[1]。为满足新的应用场景和技术需求, 5G技术标准中引入了包括大规模天线阵列、全双工技术、软件定义网络、网络功能虚拟化等关键技术^[2], 这些物理层与网络层技术一方面会导致潜在的安全威胁, 另一方面也会提升5G系统和终端的安全能力。同时, 面向新业务与新应用的多形态5G部署, 比如5G物联网、5G车联网和5G专网^[3,4], 以及5G基础设施与垂直行业的典型业务的结合^[1], 可能会导致更多的系统安全问题和用户隐私泄露^[5]。此外, 由于并行/分布式架构和量子计算带来的计算力提升, 及基于大数据和人工智能的先进数据分析方法, 5G已有的安全架构与安全技术面临着新的安全威胁^[6]。

1) 中兴通讯. 5G 行业应用安全白皮书. <https://www.zte.com.cn/china/about/news/20190919c4>.



课堂练习

- 摘要
- 1 背景介绍
 - 2.1 系统有效性面临的威胁
 - 2.2 信息完整性面临的威胁
 - 2.3 身份认证面临的安全威胁
 - 2.4 隐私和机密性保护面临的安全威胁
- 3 5G安全架构
 - 3.1 信任模型和密钥体系
 - 3.2 身份认证
 - 3.3 安全上下文与公共陆地移动网之间的安全
 - 3.4 用户面安全
- 4 5G和B5G的安全技术研究进展
- 5 未来研究展望
- 6 结论

4 5G和B5G的安全技术研究进展

4.1 物理层安全

- 4.1.1 波束赋形和预编码
- 4.1.2 全双工技术
- 4.1.3 智能抗干扰优化算法
- 4.1.4 毫米波通信和大规模MIMO

4.2 网络层安全

- 4.2.1 SDN/NFV与网络切片安全
- 4.2.2 隐私保护
- 4.2.3 密钥体系和认证增强

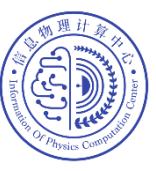
4.3 应用层安全

- 4.3.1 D2D/车联网
- 4.3.2 物联网

5 未来研究展望

- 5.1 物理层安全
- 5.2 网络层安全
- 5.3 应用层安全

6 结论



2.7 文献综述撰写-查找参考

中文：知网

英文：Google Scholar (镜像：lanfanshu.cn)

Google 学术搜索

输入关键词，和Review



不限语言 中文网页 简体中文网页

The screenshot shows the Google Scholar interface with the search term "radars review" entered. Below the search bar, there are three radio button options: "不限语言" (selected), "中文网页", and "简体中文网页". The search results list several academic papers, with one result highlighted: "Automotive radars: A review of signal processing techniques" by SM Patole, M Torlak, D Wang... from IEEE Signal Processing Magazine, 2017. The result has 63 citations and 2 versions. A blue arrow points from this result to the IEEE Xplore page below.

The use of imaging radars for ecological applications—a review
ES Kasischke, JM Melack, MC Dobson - Remote sensing of environment, 1997 - Elsevier
At the behest of NASA's Mission to Planet Earth, the National Research Council recently conducted a **review** on the current status and future directions for earth science information provided by spaceborne synthetic aperture **radars**. As part of this process, a panel of 16 ...
☆ 99 被引用次数: 473 相关文章 所有 9 个版本

Automotive radars: A review of signal processing techniques
SM Patole, M Torlak, D Wang... - IEEE Signal Processing ..., 2017 - ieexxplor.ieee.org
Automotive **radars**, along with other sensors such as lidar,(which stands for" light detection and ranging"), ultrasound, and cameras, form the backbone of self-driving cars and advanced driver assistant systems (ADASs). These technological advancements are
☆ 99 被引用次数: 63 相关文章 所有 2 个版本

打开它

A review on the application of nonattenuating frequency **radars** for estimating r attenuation and space-diversity performance

J Goldhirsh - IEEE Transactions on Geoscience Electronics, 1979 - ieexxplor.ieee.org
Cumulative rain fade statistics are used by space communications engineers to establish transmitter power and receiver sensitivities for systems operating under various geometries, climates, and radio frequencies. Space-diversity performance criteria are also of interest ...
☆ 99 被引用次数: 45 相关文章 所有 5 个版本

The screenshot shows the IEEE Xplore Digital Library interface with the search term "Automotive radars: A review of signal processing techniques" entered. The search bar also includes "Enter keywords or phrases (Note: Searches metadata only by default. A search for 'smart grid' = 'smart AND grid')". The results list the same paper from IEEE Signal Processing Magazine, 2017. The page shows 4 Author(s) and provides links to 38 Paper Citations and 14141 Full Text Views.

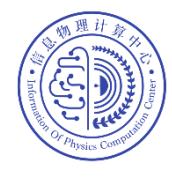
Automotive radars: A review of signal processing techniques

4 Author(s) Sujet Milind Patole ; Murat Torlak ; Dan Wang ; Murtaza Ali View All Authors

38 Paper Citations 14141 Full Text Views

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PDF在这里
照猫画虎

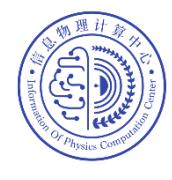


2.7 文献综述撰写-流程要求

流程
要求

请统一

- 标题
 - 作者和作者单位
 - 摘要 (150字左右)
 - 关键词 (4~5个关键词)
 - 英文标题
 - 英文摘要
 - 英文关键词
- 抬头
-
- 引言
 - 子标题1
 - 子标题2
 - . . .
 - 结论
 - 参考文献 (不少于10篇)
- 正文 (不少于2000字)
- 图文并茂



2.7 文献综述撰写-格式要求

格式
要求

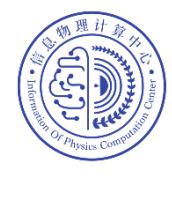
请统一

可以去“电子科技大学学报”、“中国科学”下载模版

- 全文用A4纸
 - 标题（黑体三号字）
 - 作者和作者单位（仿宋五号字）
 - 摘要（仿宋五号字，摘要两个字加粗）
 - 关键词（仿宋五号字）
 - 英文标题
 - 英文摘要
 - 英文关键词
- } Times New Roman
- 子标题（仿宋四号字）
 - 正文（仿宋小四）
 - 其中作图：宽度16cm，图注：5号字
 - 参考文献（子标题仿宋四号字，其他五号字）
 - 文献格式很重要

打开你的WORD

如何用好WORD
也是一门技术



2.7 文献综述撰写-格式要求

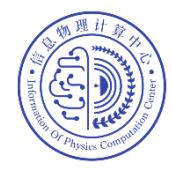
如何用好WORD 也是一门技术

插播介绍，课外知识：常用的写作软件有哪些？

Microsoft Office系列，一般WORD用于书写，PPT用于处理图像，EXCEL用于数据管理

Latex编辑器，用编程的手法操作，独特的优势是，格式和排版是全自动的

EndNote和Mendeley，文献管理工具，用于参考文献格式校准和插接。



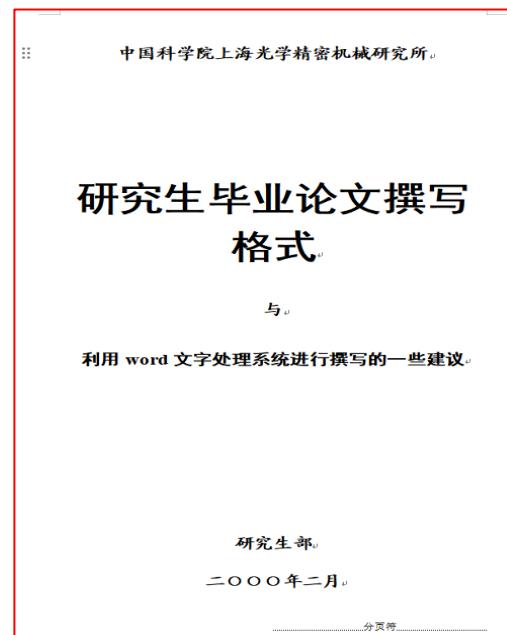
2.7 文献综述撰写-格式要求

Word Or LaTex?

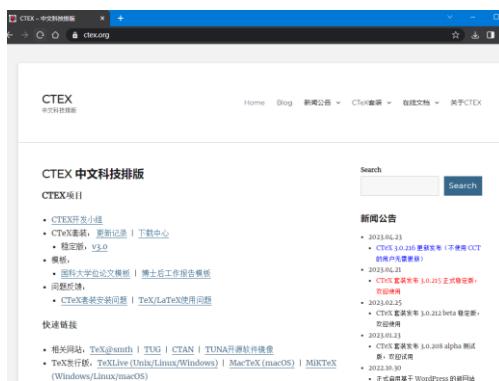
- LaTeX 与 Word 是两种不同类型的文本编辑处理系统，各有所长
- 如果要对文字编辑性能和使用便捷程度等作综合评比，Word 明显优于 LaTeX，仅“所见即所得”一项，Word 就会赢得绝大多数用户
- 但要仅限定在学术报告和科技论文方面，评比结果就不同了。



点击这左侧，可以打开查看 word 写论文技巧



关于LaTeX的故事，请查阅
<https://ctex.org/>

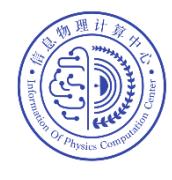




2.7 文献综述撰写-格式要求

- UESTC 本科Latex毕设论文模板 无痛上手指南
 - https://zhuanlan.zhihu.com/p/126712982?from_voters_page=true
- Github链接
 - <https://github.com/x-magus/ThesisUESTC/issues/109>

The screenshot shows a Zhihu post page. At the top, it displays the title '电子科技大学 学士学位论文' (Bachelor Thesis) in Chinese and 'BACHELOR THESIS' in English. Below the title is the official logo of University of Electronic Science and Technology of China (UESTC). The main content of the post is a LaTeX template for undergraduate theses, with the file name 'thesis.uestc.tex'. A red box highlights this file name. The post has received 506 likes and includes a note at the bottom: '置顶：如果大家觉得这篇文章对毕设有帮助，也欢迎转发给更多的朋友~注明出处即可~' (Top-mounted: If everyone finds this article helpful for their thesis, please share it with more friends~ cite the source~).



2.7 文献综述撰写-格式要求

文献
格式

● 期刊格式

1. Fu X H, Jiang H Y, Zhang J, et al. Preparation of short and medium wave infrared anti-reflective coating based on chalcogenide glass[J]. Chinese Journal of Lasers, 2017, 44(9): 0903002.
2. 付秀华, 姜洪妍, 张静, 等. 基于硫系玻璃的短中波红外减反膜研制 [J]. 中国激光, 2017, 44(9): 0903002.
3. Feng Y J, Wang X J, Ke W W, et al. Numerical analysis to four-wave mixing induced spectral broadening in high power fiber lasers[J]. Proceedings of SPIE, 2015, 9255: 92550Q.

● 图书格式

1. Yariv A, Yeh P. Optical electronics in modern communications[M]. Chen H M, Shi W H, Wang J L, et al, Transl. 6th ed. Beijing: Electronic Industry Press, 2014: 15-28.
2. 阿曼·亚里夫, 波奇·耶赫. 光子学: 现代通信光电子学[M]. 陈鹤鸣, 施伟华, 汪静丽, 等, 译. 6版. 北京: 电子工业出版社, 2014: 15-28.



2.7 文献综述撰写-格式要求

文献
格式

● 学位论文格式

1. Huang H. Design and manufacture of branch optic waveguide phase modulator for fiber optic gyroscope[D]. Chengdu: University of Electronic Science and Technology of China, 2004: 20-28.
2. 黄禾. 光纤陀螺仪用集成光波导Y分支相位调制器的设计与制作[D]. 成都: 电子科技大学, 2004: 20-28.

● 会议论文格式

1. Chen S T, Cheng J H, Gao W. A phase modulation method for improving the scale factor stability of fiber-optic gyroscope[C]//Proceedings of 2008 IEEE International Conference on Mechatronics and Automation, 2008, 978: 37-42.
2. Shi Y, Mallik R K, Letaief K B. Power control for relay-assisted wireless systems with general relaying[C]. IEEE International Conference on Communications, 2010: 11412565.

2.7 文献综述撰写-引用要求

综述的
学术
道德
原则

请务必注意

避免盗版嫌疑的两个凡是：
凡是引述他人的，一律需要引用
凡是别人的图，一律在图注引用

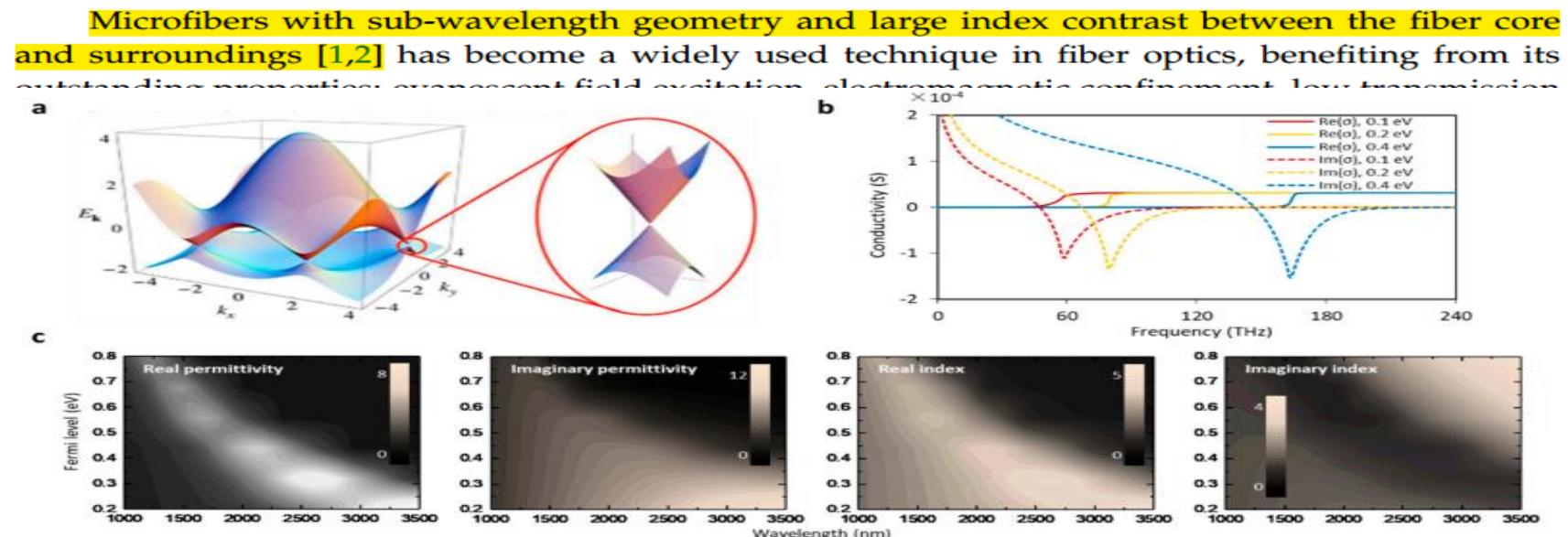
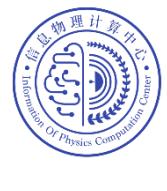


Figure 1. Optoelectronic property of graphene **(a)** Band structure; **(b)** Calculated conductivities varying in Fermi level; **(c)** Calculated permittivity and refractive index, in real and imaginary parts, respectively. Here **(a,b)** are reproduced from Refs. [36,42], respectively.



2.7 文献综述撰写-标题

标题，作为行文的名字，是书写的第一步，古语云：名不正，则言不顺。

- 中文：一般不宜超过25个字
- 英文：一般不宜超过10个单词

一般形式：定语 + 名词 的 组合

方法 核心内容
类别
范围
技术路线
。 。 。
等描述性词

比如：

- 基于有源相控阵雷达的信号复用技术研究
- 用神经网络深度学习方法实现的二维拓扑材料筛选
- 基于石墨烯的光电子信号发生器、调制器和探测器：综述

目标：简单+明确



2.7 文献综述撰写-摘要

摘要，可以理解为标题的拓展，让你有机会把标题讲的更透彻，更诱人，让人有读下去的兴趣。

- 所以当然是围绕标题来进行阐述
- 摘要，作为精简的全文，每一句话都应该有独立的意义，每一句话都不是废话。

写好摘要，有没有推荐的套路呢？当然有。
简单的摘要只需要5句。

按句子拆分：

- 第一句：对科学背景进行简要回顾
- 第二句：找出科学背景和本文的连接点（focus开始啦）
或者提出科学问题、技术难题（选题意义来啦）
- 第三句：提出本文的主要内容，核心信息和重点工作
- 第四句：点出本文的技术路线，标出创新点、特点，等等
- 第五句：拓展提升，强调意义



2.7 文献综述撰写-摘要

举例1

石墨烯光纤信息与通信器件综述

石墨烯材料的发展连接了光电子学、微纳米技术和材料物理学，作为一种柔性薄膜，其便于组装在光纤光波导平台上。

近年来，基于石墨烯的光纤功能器件以其丰富功能化，推动着光电子学科的发展。

本文重点关注被广泛应用的传感、激光和非线性器件，综述介绍了石墨烯及其相关材料的制备工艺和与光纤结合的方法。

通过对国内外相关研究成果进行综述，充分展现了石墨烯光纤器件的性能和应用优势。

举例2

雷达前向散射信号处理技术综述

雷达技术被广泛的应用在国防安全、空间探索、自动驾驶等关键应用中，支撑着当代信息网络的发展。

近年来，基于前向散射的雷达技术体现出越来越多的技术优势，比如.....。

相比于后向散射，雷达前向散射信号的解析复杂程度更高。近年来，该方向的研究成为雷达信号处理的热点。

本文通过对国内外相关研究成果进行综述，简要介绍了.....的最新进展，并对不同的技术方案作简单的比较和评价。

摘要：简洁、准确、有指示性



2.7 文献综述撰写-引言



雷达学报

雷达学报
JOURNAL OF RADARS

Journal of Radars

ISSN 2095-283X,CN 10-1030/TN

交叉眼干扰研究综述

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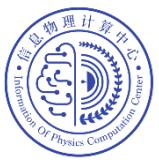
摘要: 交叉眼干扰是一种能够有效对抗单脉冲雷达的角度欺骗干扰。随着对抗主动式雷达导引头的需求提升, 研究交叉眼干扰理论、研制交叉眼干扰系统正成为电子战领域的热点问题。本文从交叉眼干扰的理论发展、装备发展、应用难题以及研究趋势四个方面进行综合论述, 以期提供交叉眼干扰的全面认识和后续研究思路。

关键词: 电子战; 单脉冲雷达; 角度欺骗干扰; 交叉眼干扰

中图分类号: TN974

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2.7 文献综述撰写-引言



引言就是 摘要第一句和第二句 的拓展

和英语写作要求一样 一般是总分格式

每一段的第一句囊括本段的核心主旨

还有其他表述方法吗？

1 引言

高效低费的精确制导武器已成为战场上最主要的硬杀伤武器，是空海战场中战机、舰船等武器装备的主要威胁来源。为提高飞机、舰船平台的战场生存能力，对抗精确制导武器的跟踪打击，自卫式电子干扰正成为电子战（Electronic Warfare, EW）领域的研究热点。

先进的空空导弹、反舰导弹等精确制导武器广泛采用主动式雷达导引头。在雷达导引头角跟踪中，通常采用兼具较高的测角精度和较强的抗干扰能力的单脉冲测角方式^[1]。干扰单脉冲雷达一度成为电子战领域的研究难点^[2-6]。根据 Dave Adamy 在 EW101 中的总结^[4]，单脉冲雷达干扰样式大致有以下几种：地形反弹干扰^[7]、镜像干扰、边频干扰、闪烁干扰^[8,9]、拖曳式诱饵^[10]、交叉极化干扰^[11]，以及交叉眼干扰^[12,13]。当前，形成装备的主要干扰样式大多属于体外式非相干角度欺骗干扰，如机载拖曳式诱饵、舰射“海妖”伞降式诱饵弹、“纳尔卡”悬停式诱饵弹等，如图 1 所示，其特点是干扰机被配置在被保护平台之外，通过发射大功率干扰信号诱骗来袭导弹，实现平台自卫。



(b) 海妖伞降式诱饵弹

(-)-AN/ALE-50 拖曳式诱饵

4) 海妖金路式诱饵弹

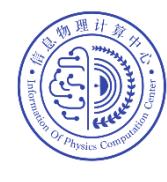
→ 纳尔卡县信式诱饵弹

(b) "Siren" active decoy

然而,现有的体外式非相干角度欺骗干扰在实战条件下干扰效果并不理想。例如,机载拖曳式诱饵存在干扰锥形盲区、诱偏性能不稳定、影响载机机动等问题^[14];伞降式诱饵弹受气象条件影响较大,恶劣气象条件下难以使用,工作时间受限于降落伞的性能^[15];悬停式诱饵弹使用过程较为复杂,需要发射前根据被保护舰船的航向、航速以及风向等参数,计算最佳发射时间和飞行航线,并有在空中悬停时间短的缺陷^[16]。

相比之下，交叉眼干扰是一种能够有效对抗单脉冲测角雷达的干扰样式，属于相干干扰体制，干扰机被配置在被保护平台之上。交叉眼干扰具有可靠性高、系统反应时间短、有效干扰时间长、寿命周期成本低，以及能够对抗多导弾威胁等优势^[5,6]，近年来受到国内外学者的广泛关注。

本文将从交叉眼干扰的理论发展、装备发展、应用难题以及研究趋势等方面详细阐述，试图为研究者提供关于交叉眼干扰的全面认识。本文论述理论发展时，根据交叉眼干扰发展的时间脉络划分了三个发展阶段；论述装备发展时，从试验情况、现役装备两个方面进行了阐述；论述应用难题时，以研制交叉眼干扰系统为落脚点，从干扰天线结构、系统参数容限、干信比需求以及干扰环路差异四个方面综合论述；最后对交叉眼干扰的研究趋势进行了前瞻性分析。



2.7 文献综述撰写-引言

1· 引·言·

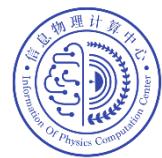
石墨烯（Graphene），一种由单层碳原子组成六角型呈蜂巢晶格的二维碳纳米材料^[1,2]，自 2004 年诞生以来，就成为纳米技术研究的热门话题，受到物理学家，化学家，材料科学家和工程师的密切关注^[3-6]，推动了从化学物理学，材料科学^[7,8]到光电子学，力学和热学的发展^[9-12]。特别是在光电子学中，由于其准粒子狄拉克费米子遵循线性色散和手征对称性^[13,14]，使得石墨烯的光学传导率仅由精细结构常数^[15]决定。此外，石墨烯具有独特的零带隙，其电荷载流子浓度可以通过施加的电场控制^[3]，使其具有显著的载流子密度可调性和相应的表面灵敏度^[16-18]。基于其独特且优异的光电子学特性，研究者们探索了一系列基于石墨烯的先进光电子和光子器件，如调制器^[19,21]，光电探测器^[22]和可控等离激元^[18,23-24]，超快激光器，光学非线性器件和传感器^[25-32]，在光电子应用，特别是微纳/集成光电子应用中展现出广阔的前景^[11,25,33]。本文就基于石墨烯的光纤功能化激光和传感器件展开综述，具体包括基于石墨烯光纤复合结构的制备技术、传感器、激光器和非线性控制器件。

好引言的境界：让外行也能读懂



投票 最多可选1项

设置



你喜欢看短的引言，还是一个长的引言？

A

短而简介的

B

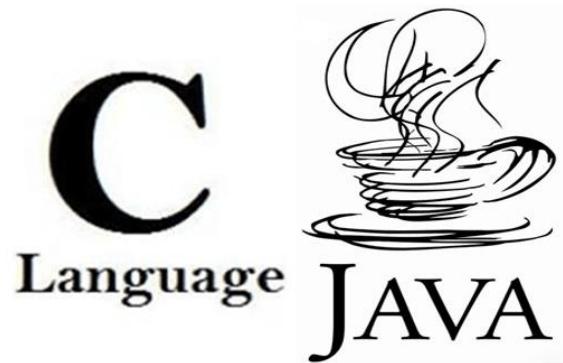
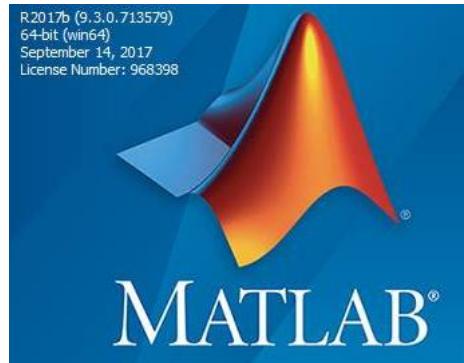
长而详细的

提交



2.8 文献综述撰写-正文结构

逻辑，或者说程序的核心思想：模块化



计算机语言的成功，
就在于模块化的函数调用。

科技写作的要则，
在于子标题的分级

同级别的子标题，呈现并列关系或递进关系；
不同级别的子标题，呈现总分关系或组成关系；
在正文的小节前，或末尾段落，需要一个概述或小结。



2.8 文献综述撰写-正文结构

正文怎么分段、怎么布局?

(例1)

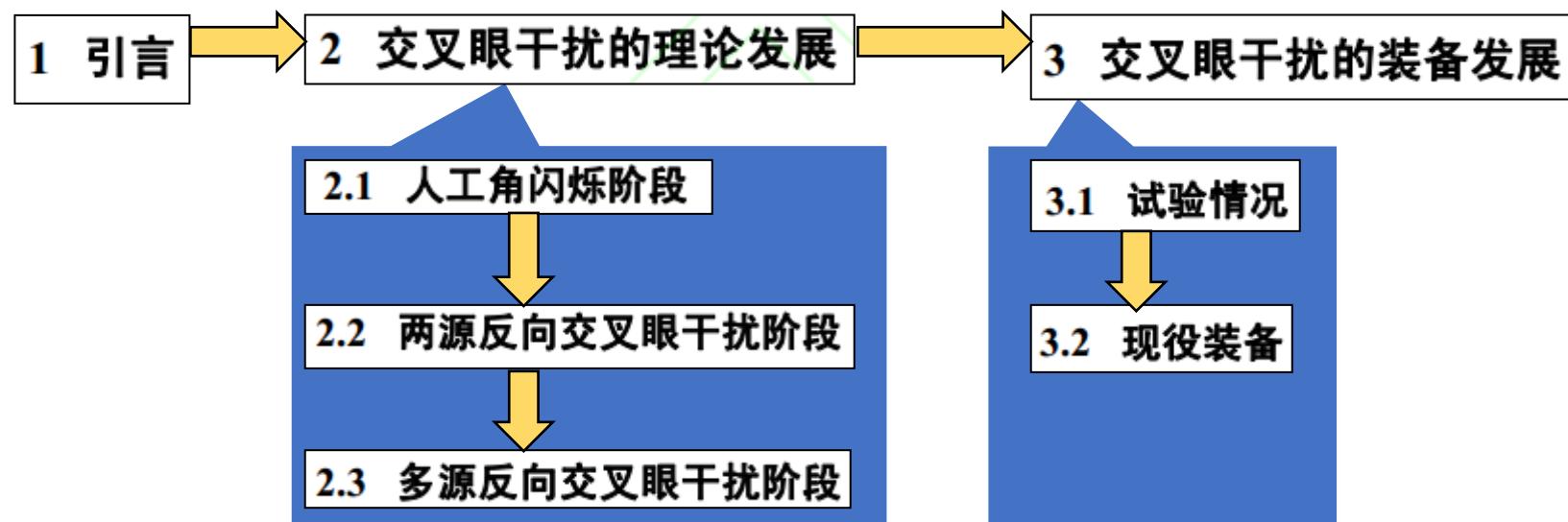
交叉眼干扰研究综述

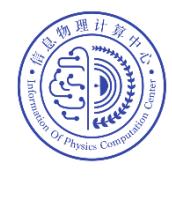
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2.8 文献综述撰写-正文结构

正文怎么分段、怎么布局?
(例2)

基于石墨烯的光纤功能化传感和激光器件

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1 引言

2 基于石墨烯的功能化光纤复合结构及其制备技术

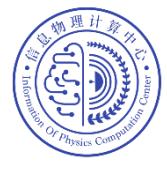
- 2.1 光纤制备
- 2.2 石墨烯制备
- 2.3 二者如何组合

3 基于石墨烯的多功能光纤传感器

- 3.1 物理量传感
- 3.2 化学量传感
- 3.3 生物量传感

4 基于石墨烯的光纤超快激光器及非线性器件

- 4.1 调Q激光器
- 4.2 锁模激光器
- 4.3 非线性激光器



2.8 文献综述撰写-正文结构

正文怎么分段、怎么布局? (例3)

章节列表

- 1 背景介绍
- 2 5G网络安全威胁
- 3 5G安全架构
- 4 5G和B5G的安全技术研究进展
- 5 未来研究展望
- 6 结论

6 结论

综上所述,本文重点总结了5G和B5G的安全最新研究进展,从面临的安全威胁、5G安全架构,以及安全技术研究现状3个方面,从方法到标准对相关研究进展进行了广泛的回顾。首先本文从对系统有效性、信息完整性、身份认证、隐私保护4个方面,分析了5G网络面临的安全威胁。其次,面对这些威胁,5G网络安全架构构建了新的信任模型,同时在密钥体系、接入与身份认证和运营商网络安全方面,均有提升安全性能的具体技术方案。第三,总结了物理层安全、网络层安全及应用层安全的最新研究进展和标准现状。最后对未来B5G安全可研究的方向进行了归纳。

限于篇幅和作者视角,本文对5G安全威胁和各类安全技术的总结还不能完全展开,所给结论仅供参考。

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评述

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5G 安全技术研究与标准进展

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3 5G安全架构

3.1 信任模型和密钥体系

3.2 身份认证

3.3 安全上下文与公共陆地移动网之间的安全

3.4 用户面安全

4 5G和B5G的安全技术研究进展

4.1 物理层安全

4.2 网络层安全

4.3 应用层安全

5 未来研究展望

5.1 物理层安全

5.2 网络层安全

5.3 应用层安全



2.9 文献综述撰写-图

我们讲了：flow and style faith

- Flow就是指的以图讲话，style faith主要考虑图文并茂。
- 结构上依然遵循总分原则，每段的第一句话标明本段主旨。

例如：

图1 (a) 展现了在2017年发表的一篇研究成果中，所描述的雷达正向散射成像的信息获取与处理流程[1]。

与传统的数据处理技术相比，其主要特点是，采取了深度学习策略，统计和分析成像数据信息，并进行去噪和拟合，以获得多维的特征信息.....。

这种技术的突出优势有，.....，如图1 (b) 所示，.....，其指标为.....。

同时，在进行信号处理的过程中，也存在一些难以解决的问题，.....。

2.9 文献综述撰写-图

专业写作中的图，主要分为三类：

- (1) 概念图和照片，主要用于描述形象（特点，一般都比较好看，是判断作者态度和水平的一个窗口）；
- (2) 过程图和程序图，主要用于展示逻辑（特点：一般作为核心阐述点之一，注重各种关系，连词的聚居地）；
- (3) 数据图和统计图，主要用于说明定量（特点，坐标轴和单位）。

ARTICLE

Mastering the game of Go with deep neural networks and tree search

David Silver^{1*}, Aja Huang^{1*}, Chris J. Maddison¹, Arthur Guez¹, Laurent Sifre¹, George van den Driessche¹, Julian Schrittwieser¹, Ioannis Antonoglou¹, Veda Panneershelvam¹, Marc Lanctot², Sander Dieleman¹, Dominik Grewe¹, John Nham², Nal Kalchbrenner², Ilya Sutskever², Timothy Lillicrap², Madeleine Leach², Koray Kavukcuoglu¹, Thore Graepel² & Demis Hassabis¹

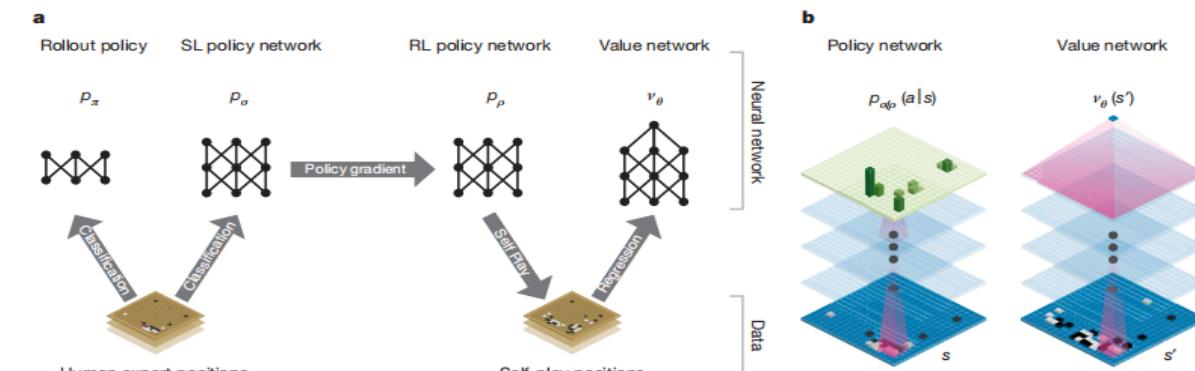
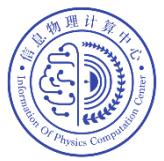


Figure 1 | Neural network training pipeline and architecture. a, A fast rollout policy p_π and supervised learning (SL) policy network p_σ are trained to predict human expert moves in a data set of positions. A reinforcement learning (RL) policy network p_ρ is initialized to the SL policy network, and is then improved by policy gradient learning to maximize the outcome (that is, winning more games) against previous versions of the policy network. A new data set is generated by playing games of self-play with the RL policy network. Finally, a value network v_θ is trained by regression to predict the expected outcome (that is, whether

the current player wins) in positions from the self-play data set. b, Schematic representation of the neural network architecture used in AlphaGo. The policy network takes a representation of the board position s as its input, passes it through many convolutional layers with parameters σ (SL policy network) or ρ (RL policy network), and outputs a probability distribution $p_\sigma(a|s)$ or $p_\rho(a|s)$ over legal moves a , represented by a probability map over the board. The value network similarly uses many convolutional layers with parameters θ , but outputs a scalar value $v_\theta(s')$ that predicts the expected outcome in position s' .

每一幅图都应该要有标题，并在正文中呼应。



2.9 文献综述撰写-图

COMMENT



Androids, such as this one directing shoppers in Tokyo, will replace humans in many service occupations in the next 10–20 years.

Track how technology is transforming work

Without data on how artificial intelligence is affecting jobs, policymakers will fly blind into the next industrial revolution, warn Tom Mitchell and Erik Brynjolfsson.

Advances in technology pose huge challenges for jobs. Productivity levels have never been higher in the United States, for example, but income for the bottom 50% of earners has stagnated since 1999 (see ‘Job shifts’). Most of the monetary gains have gone to a small group at the very top. Technology is not the only reason, but it is probably the most important one.

A report published on 13 April by the US National Academies of Sciences, Engineering, and Medicine details the impacts of information technology on the workforce. We co-chaired the report committee and learnt a great deal in the process — including that, over the next 10–20 years, technology will affect almost every occupation. For example, self-driving vehicles could slash the need for drivers of taxis and long-haul trucks, and online education could enrich options for retraining of displaced workers.

Most important, we learnt that policymakers are flying blind into what has been called the fourth industrial revolution or the second machine age. There is a remarkable lack of data available on basic questions, such as: what is the scope and rate of change of the key technologies, especially artificial intelligence (AI)? Which technologies are already eliminating, augmenting or transforming which types of jobs? What new work opportunities are emerging, and which policy options might create jobs in this context?

At best, this paucity of information will lead to missed opportunities. At worst, it could be disastrous. If we want to understand, prepare for and guide the unpredictable impacts of advancing technology, we must radically reinvent our ability to observe and track these changes and their drivers.

Fortunately, many of the components of a fit-for-purpose data infrastructure are

already in place. Digital knowledge about the economy is proliferating and has unprecedented precision, detail and timeliness. The private sector is increasingly adopting different approaches to generating data and using them in decision-making, such as AI’s testing to compare alternatives. And technologies that protect privacy while allowing statistical summaries of large amounts of data to be shared are increasingly available.

We call for the creation of an integrated information strategy to combine public and privately held data. This would provide policymakers and the public with ways to negotiate the evolving and unpredictable impacts of technology on the work force. Building on this, we call for policymakers to adopt an evidence-based ‘sense and respond’ approach, as pioneered by the private sector.

These are big changes, but the stakes for workers and the economy are high.

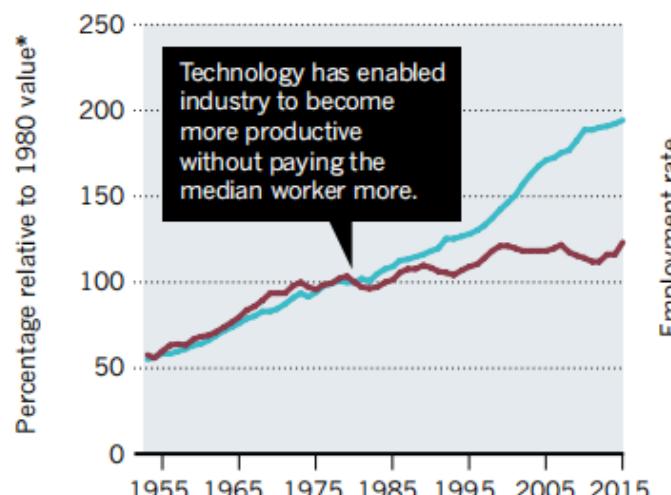
290 | NATURE | VOL 544 | 20 APRIL 2017

JOB SHIFTS

For most people in the United States, incomes have stagnated (**A**) as the number and nature of jobs have changed over the past four decades (**B**).

A Levels of productivity and median income

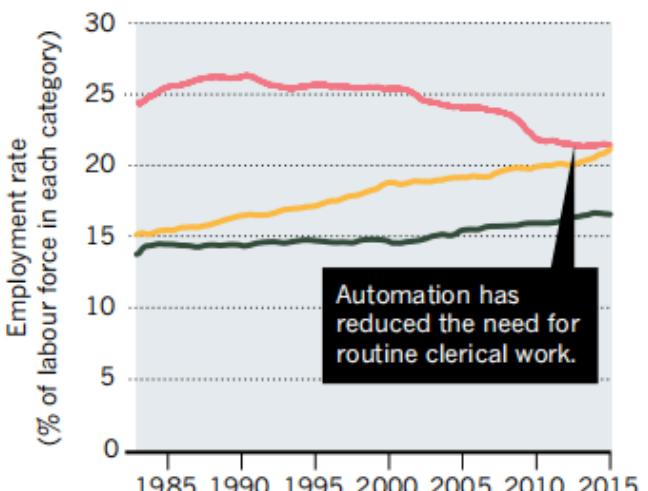
— Productivity (US\$ output per hour)
— Real median family income (US\$ earned per year)



*In 1980, real median family income was \$57,600 a year and productivity was \$55 per hour.

B Employment type

— Clerical and sales — Professional — Service

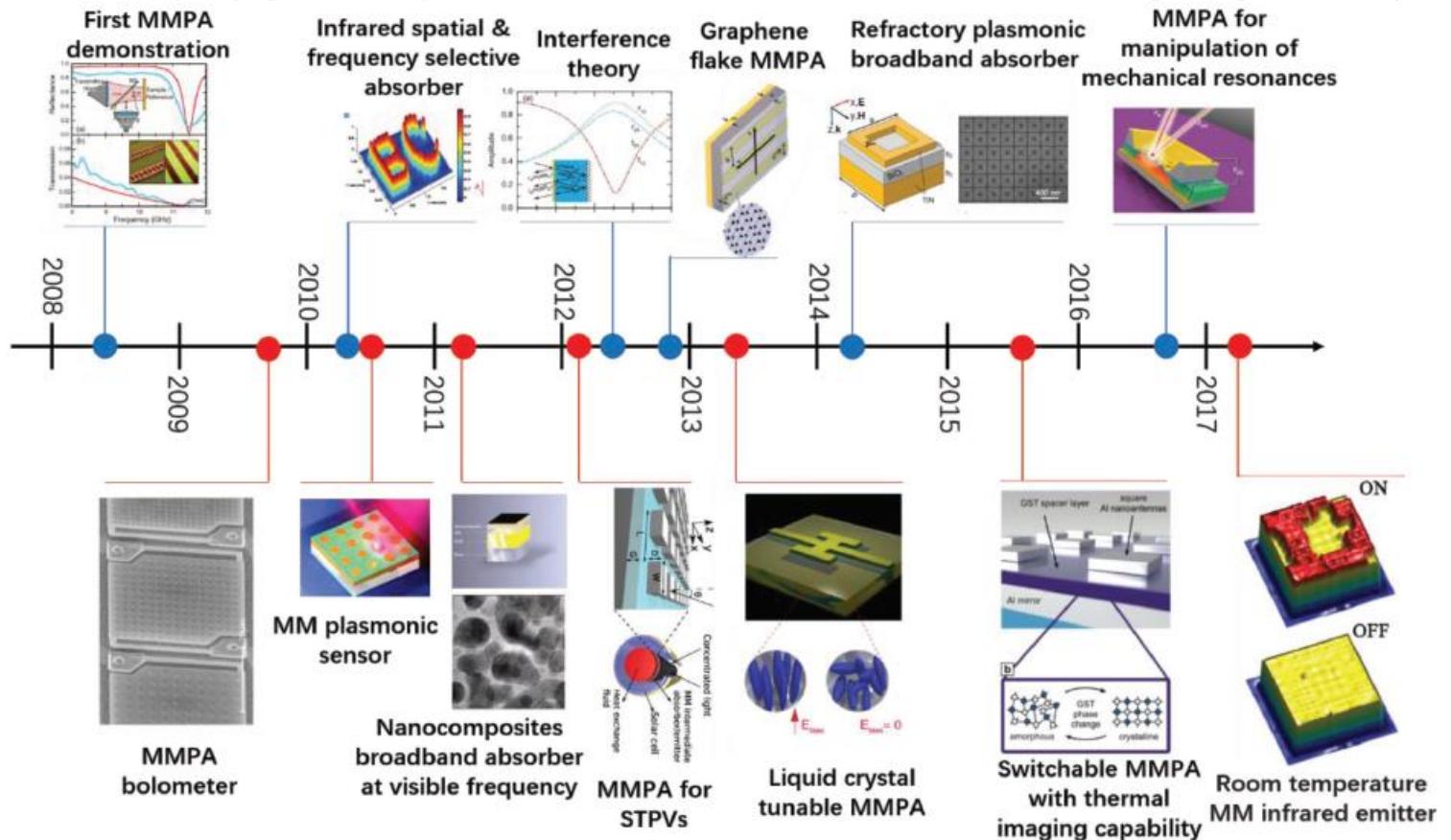


图中曲线粗细、颜色、细节标注都是关键！

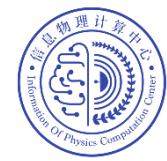
2.9 文献综述撰写-图

Broadband Metamaterial Absorbers

Peng Yu, Lucas V. Besteiro, Yongjun Huang, Jiang Wu, Lan Fu, Hark H. Tan,
Chennupati Jagadish, Gary P. Wiederrecht, Alexander O. Govorov,* and Zhiming Wang*



善用时间历程碑图，描述技术发展历史



2.9 文献综述撰写-图

编程仿真类: Matlab, Mathcad, Octave, Python,

文档工具: Word, Visio, Powerpoint, Excel,....

专业绘图工具: Photoshop, Adobe Illustrator ...

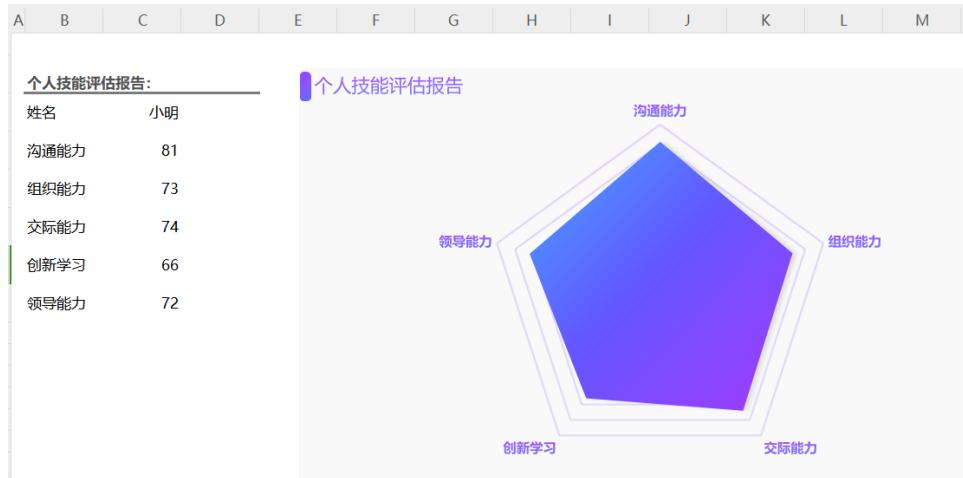
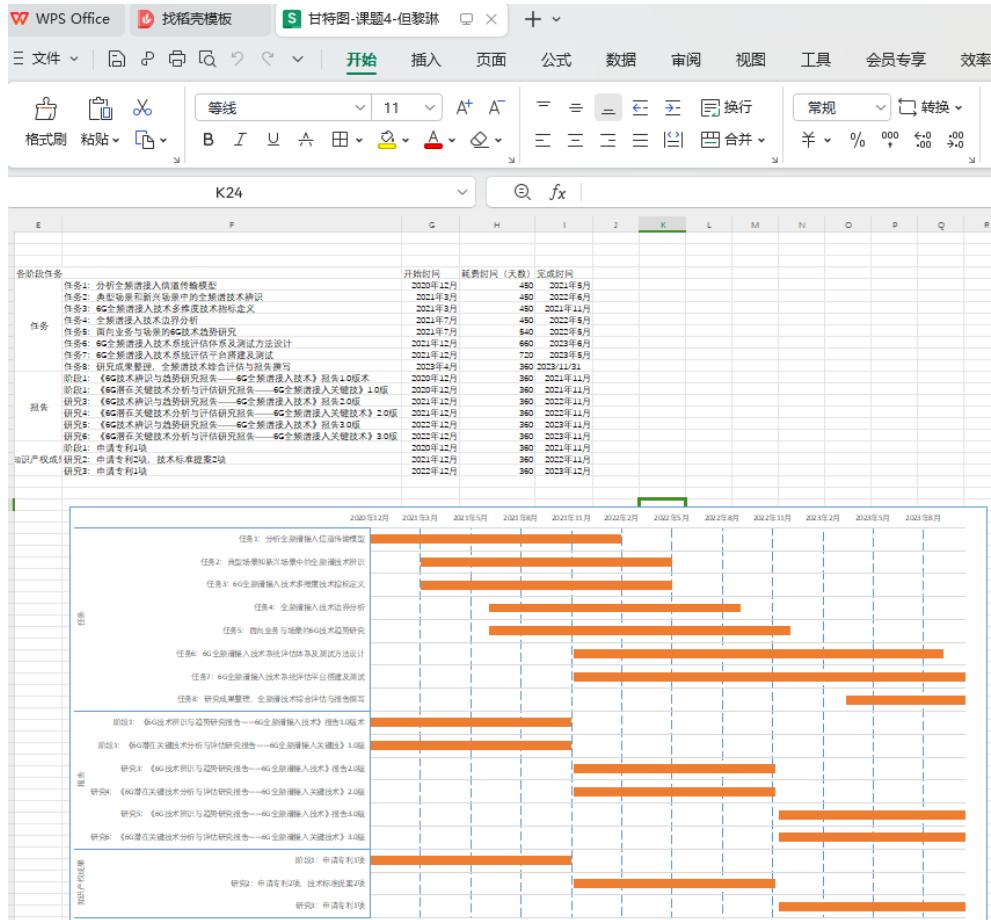




2.9 文献综述撰写-图



Excel画甘特图与包络图/雷达图





2. 10 文献综述撰写-结论

结论是摘要的呼应提炼，所以应该写的像摘要

Why?

读者们靠结论记住你的文章

那和摘要有没有明显的区别？

有，区别在于结论具有展望性

5· 展·望·

本文回顾了基于石墨烯的光纤功能化传感和激光器件的制备,测试和性能。基于石墨烯的光纤传感器、激光器和通信控制器已经成为信息领域研究的热点，并已经在实际的应用中发挥了重要作用。石墨烯与光纤的结合是功能化光电子器件的研究趋势之一，能够更高精度、高灵敏度的实现参量传感和信息转化，也能更灵活的用于光纤系统中。在未来，通过基于石墨烯的激光传感^[176]，基于高阶非线性的增强^[120]，中红外范围到太赫兹区域的等离子体传感^[177]，声子激光^[178]以及奇异点（EP）增强^[179]和光纤直接融入石墨烯^[180,181]等新原理、新设计和新技术，有望实现功能更为多样，性能更为强大的传感和激光器件，以服务光调制^[182,183]，光探测^[184,185]等更多需求。此外，还有望结合分布式传感网络的热点研究^[186,187,188]，带来整个传感网络灵敏度的提升和智能化。目前，基于光纤平台的石墨烯的微纳光电子复合结构的设计、制备和测试仍然是一个有挑战性的工作，相关研究将进一步推进光纤光学、纳米科学和光电子学的深度融合，支持全光纤通信网和物联网技术的发展。



2.11 文献综述撰写-参考文献

参考文献的融入和交叉引用

我们都注意到了，相比于别的文体，科技文献最重要的特征之一就是**参考文献**。

参考文献一般是公开发表的，大致分为如下几类：

期刊论文 [J]

图书和
图书章节
[M]

报刊和
新闻 [N]

会议论文 [C]

专利 [P]

学位论文 [D]

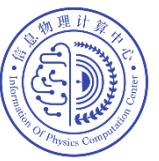
在哪里引用别人的研究成果呢？

对研究性论述，一般参考文献都集中在引言里

对综述性论述，分布在全文，但一般不出现在结论里

一个问题：引用了参考文献，就可以抄写原文了吗？

一个引用原则：**转述**。



加油站

SCI主编讲论文发表那些事（知乎）

- 盖瑞斯·戴克 (Gareth Dyke) 博士是一位高产的顶尖科学家，在过去20年中，共发表了280多篇SCI论文，其中5篇论文发表在《自然》和《科学》上，他也是著名出版社“泰勒和弗朗西斯”旗下杂志《历史生物学》的主编。
- <https://www.zhihu.com/zvideo/1256256378407886848>

Gareth J. Dyke, PhD

and a journal manager with many years experience writing and publishing my own academic papers.

www.zoology.unideb.hu/?m=Gareth_Dyke gareth-dyke-58a42645/



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gareth dyke

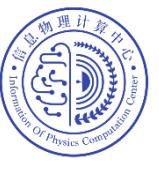
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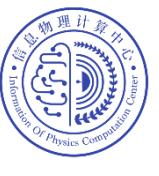
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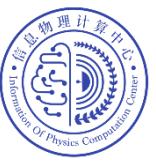
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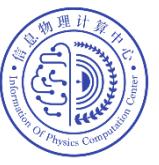




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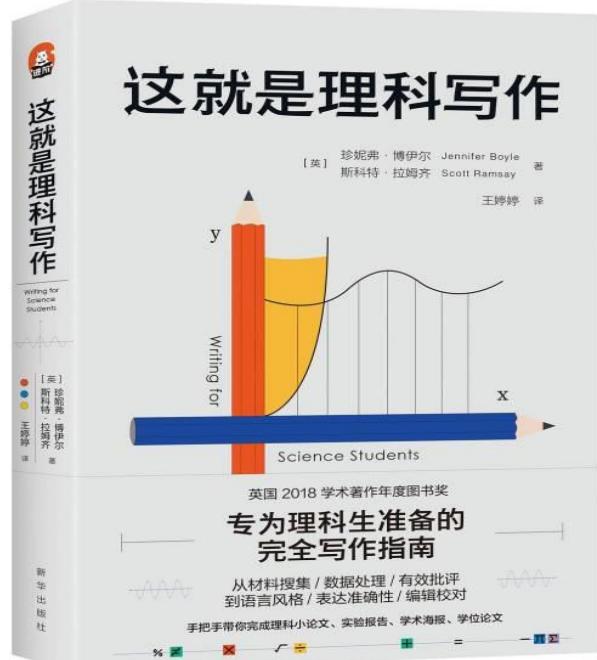
- 《这就是工科写作》
 - 涉及各类文体的格式规范、如何塑造适合工科类文本的文风、如何遣词造句和排版布局等内容
 - 23个实例演练、82条重点总结
 - 提供从动笔写作到呈现文本全过程的指导，帮助工程师更高效地与同事沟通、清晰地将专业技术知识传递给读者，从而实现职场提升
 - 也可以帮助工科学生写出条理清晰的论文和报告，助力他们在学术道路上的发展。
- 七个章节
 - “导言”“技术写作的类型”“好的写作风格”“词汇”“句子、标点符号与段落”“书面信息的形象”和“写作、发表与出版”。



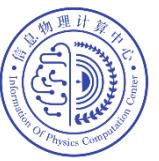


加油站

- 《这就是理科写作》
 - 详细阐释了从可能遇到的写作类型及其要求，到制订研究计划、收集整理文献资料，再到组织论文结构、编辑论文等整个论文写作过程
 - 结合多年高校的教学经验和相关研究，指出和解答了理科学生在写作时经常会遇到的疑点、难点。
- 章节
 - 第一部分：了解不同类型的理科写作
 - 第一章 实验报告
 - 第二章 小论文
 - 第三章 学位论文
 - 第四章 海报
 - 第五章 摘要



- 第二部分 准备写作
- 第六章 检索主题与评估材料
- 第七章 参考和引用他人研究成果
- 第八章 数据处理
- 第九章 运用批判性
- 第三部分 开始写作
- 第十章 撰写草稿和建构论述
- 第十一章 像科学家一样说话
- 第十二章 准确表达想法
- 第十三章 编辑和校对你的作品
- 第十四章 充分利用反馈



加油站

- 《批判性思维与说服性写作》

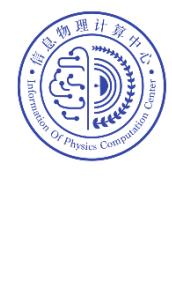
- 前半部分系统梳理了批判性思维的发展简史，随后提供了培养批判性思维的工具和方法。探讨了创造性思维与批判性思维结合的必要性及其在学术写作中的运用。
- 在后半部分介绍了如何利用叙述风格和修辞手法增强论证的说服力。
- 每个章节在讲述理论的同时提供了具有针对性的练习与活动，它们有助于读者实践新的技能、巩固已有知识、提升思维能力。





◆ 第二讲内容回顾

- 2.1 文献概述
- 2.2 文献的信息来源
- 2.3 学术道德
- 2.4 文献检索
- 2.5 文献管理
- 2.6 文献阅读
- 2.7 文献综述撰写



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