

# 应用课堂

## 共享经济时代的众包计算



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# 课程提纲

- 文献搜索
- 众包计算
- 区块链
- 总结展望

# 课程提纲

- 文献搜索
- 众包计算
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# 文献搜索技巧

- 搜索方式

- 基于来源
- 基于主题
- 基于作者

- 搜索工具

- 中文工具

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- 学术刊物：计算机学报、软件学报
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# 文献搜索技巧

## • 搜索工具

## • 中文工具

。 科普网站：科学网、中国计算机学会官网

① [www.ccf.org.cn/sites/ccf/](http://www.ccf.org.cn/sites/ccf/)

中国计算机学会  
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为计算领域的专业人士服务  
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# 技术动态

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# 文献搜索技巧

- 搜索工具
  - 中文工具

- 学术刊物：计算机学报、**软件学报**



软件学报 *Journal of Software* ISSN 1000-9825  
CODEN JUXUEW

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[《软件学报》专刊征文：复杂环境下的机器学习研究\(第一轮截稿时间：2017年1月10日\)\[2016/7/8\]](#)

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# 文献搜索技巧

- 搜索工具
- 中文工具

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① [www.jos.org.cn/ch/list\\_by\\_column.aspx?column\\_name=综述文章](http://www.jos.org.cn/ch/list_by_column.aspx?column_name=综述文章)

软件学报 *Journal of Software* ISSN 1000-9825 CODEN RUXUEW

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*Journal of Software*

这里所列的文章是所有综述文章，供读者方便阅读。

邱天宇,申富饶,赵金熙,自组织增量学习神经网络综述, 2016,27(9):2230-2247  
罗乐,刘庆,钱德沛,内存计算技术研究综述, 2016,27(8):2147-2167  
王鹤澎,王宏志,李佳宁,孔欣欣,李建中,高宏,面向新型处理器的数据密集型计算, 2016,27(8):2048-2067  
吴垚,曾菊儒,彭辉,陈红,李翠平,群智感知激励机制研究综述, 2016,27(8):2025-2047  
廖湘科,李姗姗,董威,贾周阳,刘晓东,周书林,大规模软件系统日志研究综述, 2016,27(8):1934-1947  
王洋,王之梁,毕军,施新刚,尹霞,软件定义网络中北向接口语言综述, 2016,27(4):993-1008  
沈国华,黄志球,谢冰,朱羿全,廖莉莉,王飞,刘银陵,软件可信评估研究综述:标准、模型与工具, 2016,27(4):955-968  
林伟伟,吴文泰,面向云计算环境的能耗测量和管理方法, 2016,27(4):1026-1041  
周维,周可人,秦钟治,姚绍文,钱德沛,基于共享内存的多核时代数据结构研究, 2016,27(4):1009-1025  
王蒙蒙,刘建伟,陈杰,毛剑,毛可飞,软件定义网络:安全模型、机制及研究进展, 2016,27(4):969-992

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- 搜索工具
- 中文工具

- 学术刊物：计算机学报、软件学报

① [www.jos.org.cn/ch/reader/view\\_abstract.aspx?file\\_no=5068](http://www.jos.org.cn/ch/reader/view_abstract.aspx?file_no=5068) ☆

The screenshot shows the homepage of the Software Journal (软件学报). The left sidebar contains links for visitor count (2093894), online publishing, issue directory, paper publishing, section series (highlighted in blue), search, ranking, review articles, special issues,美文分享 (beautiful articles), issue covers, email subscription, and RSS. The main content area features a banner for 'Software Journal Jou'. Below it, a research paper abstract is displayed:

邵天宇, 申富饶, 赵金熙. 自组织增量学习神经网络综述. 软件学报, 2016, 27(9):2230-2247

自组织增量学习神经网络综述  
Review of Self-Organizing Incremental Neural Network

投稿时间: 2015-11-18 最后修改时间: 2016-01-25

DOI: [10.13328/j.cnki.jos.005068](https://doi.org/10.13328/j.cnki.jos.005068)

中文关键词: 神经网络 自组织 竞争学习 增量学习

英文关键词: neural network self-organizing competitive learning incremental learning

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- 搜索工具
  - 中文工具
    - 搜索平台：中国知网、万方数据、等等

The screenshot shows the homepage of the Beihang University Library website. At the top, there is a navigation bar with links for '咨询我们' (Consultation), '用户名' (Username), '登录' (Login), and '统一认证' (Unified Authentication). Below the navigation bar, the Beihang University logo and name are displayed. The main content area features a '馆藏检索' (Collection Search) section with a search bar and a '快速链接' (Quick Links) sidebar on the right.

**馆藏检索**

使用说明：图书馆书目检索系统，可查找图书馆馆藏的印刷版文献资源

题名  在此输入关键词

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# 文献搜索技巧

- 搜索工具
  - 中文工具
    - 搜索平台：中国知网、万方数据、等等

The screenshot shows the homepage of the Beihang University Library website. At the top, there is a blue header bar with the library's logo, a search bar, and user authentication options (username, password, login, unified authentication). Below the header, the main navigation menu includes links for Home, About the Library, Document Resources (with Database Lists and Catalog), Services, and Reader Feedback. A red box highlights the "Database Lists" link under the "Document Resources" menu. On the left side, there is a sidebar with links for Collection Search (highlighted in yellow), Chinese Discovery, Foreign Discovery, Cloud Service, and Institution Library. The central part of the page features a search interface with a search bar and a "Search" button. Below the search bar, there is a note about the system being used for library catalog search. At the bottom, there are sections for News and Events, Resource Dynamics, and a banner for the library's welcome message. The right side contains a "Quick Links" section with icons and descriptions for various services like collection search, common tools, reader training, interlibrary loan, opening hours, technology news, paper submission, paper detection, book purchases, book borrowing, external visits, and mobile services. There is also a "Digital Resources" section with links for database lists, trial databases, journal navigation, Beihang SCI, institutional library, and open access.

① lib.buaa.edu.cn

咨询我们 ▼

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北京航空航天大学 LIBRARY 北航图书馆

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馆藏检索

\* 使用说明：图书馆书目检索系统，可查找图书馆馆藏的印刷 分馆资源 馆际互借

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# 文献搜索技巧

## ● 搜索工具

### ● 中文工具

。 搜索平台: **中国知网**、万方数据、等等

lib.buaa.edu.cn/resources?cid=26&pid=19

咨询我们 首页 > 数据库列表 登录 | 统一认证

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数据库列表

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序号	外文数据库	序号	中文数据库
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2	ACS [全文]	2	CSSC中文社会学引文索引 [文摘]
3	AIAA Electronic Library [全文]	3	KUKE数字音乐图书馆 [多媒体]
4	APS [全文]	4	阿帕比电子图书 [电子图书]
5	ASME [全文]	5	百链云图书馆 [全文]
6	ASP [全文]	6	北航博硕士论文 [文摘]
7	ASTM [全文]	7	超星电子图书 [电子图书]
8	Begell [全文,电子图书]	8	读秀学术搜索 [全文]
9	Cambridge [全文]	9	国家军用标准全文数据库 [全文]
10	CRC-Mechanical ENGINEERINGnetBASE [全文]	10	国研报告 [全文]
11	EBSCOhost(ASP/BSR/ERIC...) [全文]	11	龙源人文电子期刊 [全文]
12	Elsevier ScienceDirect [全文]	12	律商网 [全文]
13	Emerald [全文]	13	人大复印报刊资料 [全文]
14	EV2(Ei Compendex) [文摘]	14	锐思金融数据库 [全文]
15	Fortune [全文]	15	商劳印书馆精品工具书 [全文]
16	Frontiers in China [全文]	16	书生之家电子图书 [电子图书]
17	HeinOnline [全文]	17	万方视频公开课服务系统 [多媒体] [试用中]
18	IEEE/IEE Electronic Library [全文]	18	万方数据-期刊/会议/学位论文 [全文]
19	IMechE [全文]	19	网上报告厅 [多媒体]
20	Intel Technology Journal [全文]	20	维普考试资源库 [全文]
21	IOP [全文]	21	维普中文科技期刊数据库 [全文]
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28	NASA/AD/PB/DE [全文]	28	中国航天标准数据库 [全文]
29	Nature [全文]	29	中国知网 [全文]
30	Nature Materials [全文]	30	[待续...]

# 文献搜索技巧

- 搜索工具
  - 中文工具
    - 搜索平台：中国知网、万方数据、等等

① lib.buaa.edu.cn/resourceinfo?id=71

The screenshot shows the Beijing Jiaotong University Library website. At the top, there is a blue header bar with a search icon, a star icon, and a link to 'lib.buaa.edu.cn/resourceinfo?id=71'. Below the header are navigation links for '咨询我们', '用户名', '密码', '登录', and '统一认证'. The main content area features the university's logo and several photographs of library interiors. A blue banner at the bottom left reads '数据库详细信息'. The central part of the page displays the title '中国知网' (CNKI) in red, with the text '更新时间：2016-04-07 11:28:23' below it. A table follows, containing the following data:

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您的当前IP：	您的IP地址是222.129.37.249，属于[校外地址]
校内访问入口：	中国知网 [本地镜像] CNKI工具书[本地镜像] CNKI大百科全书[本地镜像]
学科类型：	人文 经济 法政 理工
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    - 搜索平台： Google Scholar、 DBLP、 等等

# 文献搜索技巧

- 搜索工具

- 外文工具

- 搜索平台: **Google Scholar**、DBLP、等等

<http://dir.scmor.com/google/>

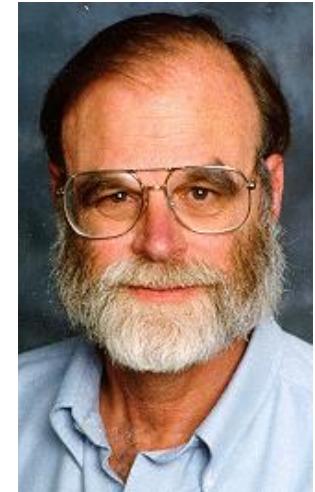
The screenshot shows a web browser window with the URL [dir.scmor.com/google/](http://dir.scmor.com/google/) in the address bar. The page features the classic Google logo with the Chinese characters "思谋导航" underneath. Below the logo, there are two main sections: "学术搜索" (Academic Search) and "网页搜索" (Web Search). Both sections list eight items, each with a speed value and a "现在访问" (Visit Now) link. At the bottom of each section, there is a specific URL for the US and Hong Kong versions of the service.

类别	内容	速度	操作
学术搜索	学术镜像1:	speed:0.04s.	现在访问
	学术镜像2:	speed:0.49s.	现在访问
	学术镜像3:	speed:0.67s.	现在访问
	学术镜像4:	speed:1.57s.	现在访问
	学术镜像5:	speed:1.62s.	现在访问
	学术镜像6:	speed:0.23s.	现在访问
	学术镜像7:	speed:0.04s.	现在访问
	学术镜像8:	speed:0.39s.	现在访问
美国官网(US): <a href="http://scholar.google.com">scholar.google.com</a>			
香港官网(HK): <a href="http://scholar.google.com.hk">scholar.google.com.hk</a>			
网页搜索	网页镜像1:	speed:3.99s.	现在访问
	网页镜像2:	speed:0.04s.	现在访问
	网页镜像3:	speed:0.43s.	现在访问
	网页镜像4:	speed:1.48s.	现在访问
	网页镜像5:	speed:0.19s.	现在访问
	网页镜像6:	speed:1.23s.	现在访问
	网页镜像7:	speed:1.47s.	现在访问
	网页镜像8:	speed:0.04s.	现在访问
美国官网(US): <a href="http://www.google.com">www.google.com</a>			
香港官网(HK): <a href="http://www.google.com.hk">www.google.com.hk</a>			

# Jim Gray回顾

- James Nicholas "Jim" Gray

- 由于在数据库系统于事务处理领域的卓越贡献，1998年获得图灵奖。
- 微软公司为其建造Redmond研究院，1995年加入微软。
- 2007年，他独自航向法拉伦岛，打算撒散母亲的骨灰，1月28日，他的船失踪。2012年，他在法律意义上被认定已经死亡。



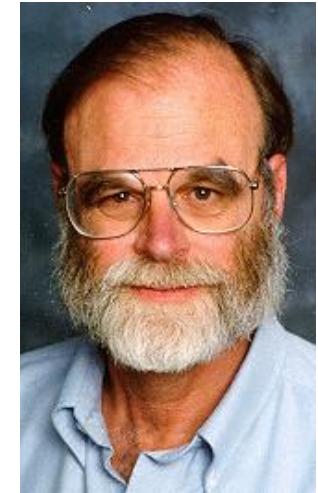
Jim Gray



Jim Gray. The Transaction Concept: Virtues and Limitations.  
In VLDB, Pages 144-154, 1981 . (CCF A类会议)

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Jim Gray. The Transaction Concept: Virtues and Limitations. In VLDB, Pages 144-154, 1981.

Jim Gray

A screenshot of a web browser showing the Google Scholar search results for the paper "The Transaction Concept: Virtues and Limitations". The URL in the address bar is <https://scholar.google.com>. The search bar contains the query "The Transaction Concept: Virtues and Limitations.". Below the search bar, there are two radio buttons: one selected for "Articles" and another for "Case law". Other navigation links include "My library", "My Citations", "Alerts", "Metrics", and "Settings". On the right side of the screen, an email address "yongxintong@gmail.com" is visible. The overall interface is dark-themed.

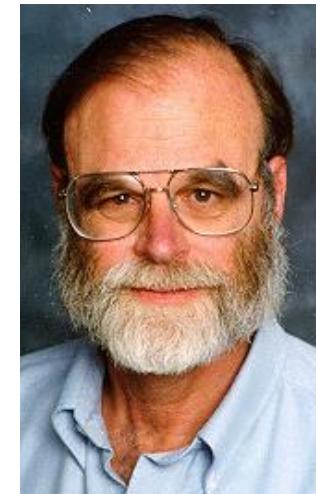


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- 搜索工具
  - 外文工具

- 搜索平台: **Google Scholar**、DBLP、等等

Jim Gray. The Transaction Concept: Virtues and Limitations. In VLDB, Pages 144-154, 1981.



Jim Gray

The screenshot shows a Google Scholar search results page. The search query is "The Transaction Concept: Virtues and Limitations". The top result is a paper by Jim Gray from 1981, titled "The Transaction Concept: Virtues and Limitations", published in VLDB. The abstract describes a transaction as a transformation of state with properties of atomicity, durability, and consistency. The page includes filters for "Articles", "Case law", and "My library", and a sidebar for "Any time" search parameters. At the bottom, there are links for "About Google Scholar", "Privacy", "Terms", and "Provide feedback".

# 文献搜索技巧

- 搜索工具
  - 外文工具
    - 搜索平台: Google Scholar、DBLP、等等

The screenshot shows a Google Scholar search results page. The URL in the address bar is [https://scholar.google.com/scholar?cites=15553426371650547409&as\\_sdt=2005&sciodt=0,5&hl=en](https://scholar.google.com/scholar?cites=15553426371650547409&as_sdt=2005&sciodt=0,5&hl=en). The search term in the search bar is "The transaction concept: Virtues and limitations". The results page displays several academic papers, with the first result being a book by PA Bernstein, V Hadzilacos, and N Goodman from 1987. The interface includes filters for citation counts, publication years, and document types, along with options to sort results and create alerts.

https://scholar.google.com/scholar?cites=15553426371650547409&as\_sdt=2005&sciodt=0,5&hl=en

Web Images More... yongxintong@gmail.com

Google

Scholar About 1,080 results (0.06 sec) My Citations

All citations Articles Case law My library

Any time Since 2016 Since 2015 Since 2012 Custom range...

Sort by relevance Sort by date

include citations  Create alert

**The transaction concept: Virtues and limitations**

Search within citing articles

PA Bernstein, V Hadzilacos, N Goodman - 1987 - [osti.gov](#)

This book is an introduction to the design and implementation of concurrency control and recovery mechanisms for transaction management in centralized and distributed database systems. Concurrency control and recovery have become increasingly important as ...

Cited by 5564 Related articles All 10 versions Cite Save More

**Principles of distributed database systems**

MT Özsu, P Valduriez - 2011 - [books.google.com](#)

This third edition of a classic textbook can be used to teach at the senior undergraduate and graduate levels. The material concentrates on fundamental theories as well as techniques and algorithms. The advent of the Internet and the World Wide Web, and, more recently, ...

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**Database management systems**

R Ramakrishnan, J Gehrke - 2000 - [202.74.245.22](#)

Page 1. Page 2. CONTENTS PREFACE xxii Part I BASICS 1.1 INTRODUCTION TO DATABASE SYSTEMS 3 1.1 Overview 4 1.2 A Historical Perspective 5 1.3 File Systems versus a DBMS 7 1.4 Advantages of a DBMS 8 1.5 Describing and Storing Data in a DBMS 9 ...

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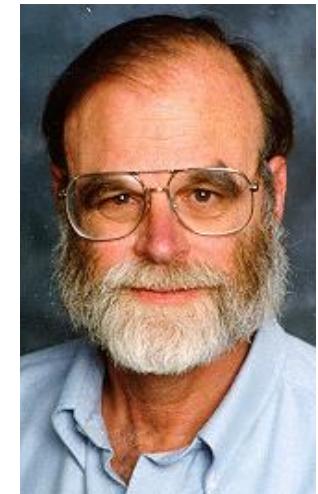
[PDF] centennialcollege.ca [PDF] 202.74.245.22

# 文献搜索技巧

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  - 外文工具

- 搜索平台: **Google Scholar**、DBLP、等等

Jim Gray. The Transaction Concept: Virtues and Limitations. In VLDB, Pages 144-154, 1981.



Jim Gray

Scholar

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The Transaction Concept: Virtues and Limitations.

[PDF] usc.edu

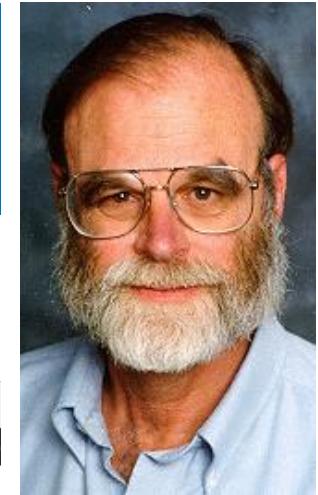
The transaction concept: Virtues and limitations  
J Gray - VLDB, 1981 - infolab.usc.edu  
ABSTRACT A transaction is a transformation of state which has the properties of atomicity (all or nothing), durability (effects survive failures) and consistency (a correct transformation). The transaction concept is key to the structuring of data management applications. The ...  
Cited by 1080 Related articles All 41 versions Cite Save More

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- 搜索工具
- 外文工具
  - 搜索平台: Google Scholar、DBLP、等等

基于“主题”与“作者”的搜索采用  
Google Scholar更为适宜，但基于“来  
源”的搜索有更好的选择！



Screenshot of a web browser showing Jim Gray's Google Scholar profile page. The URL in the address bar is <https://scholar.google.com/citations?user=Dn4kkYUAAAAJ&hl=en&oi=sra>. The page displays his profile picture, name, affiliation, and citation statistics. Below this, a list of his publications is shown, each with a title, authorship, citation count, and year.

**Jim Gray**  
IBM, Tandem, DEC, Microsoft databases  
No verified email - [Homepage](#)

**Follow**

Title	Cited by	Year
Transaction processing	4822 *	1993
Data cube: A relational aggregation operator generalizing group-by, cross-tab, and sub-totals	2810	1997
The fifth data release of the Sloan Digital Sky Survey	2758 *	2007
Notes on data base operating systems	2576	1978

**Google Scholar**

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	All	Since 2011
Citations	45400	12622
h-index	79	48
i10-index	164	100

2008 2009 2010 2011 2012 2013 2014 2015 2016

Co-authors [View all...](#)

A. S. Szalay  
David DeWitt  
Paul McJones  
Dennis Shasha  
hamid pirahesh  
Tamas Budavari

# 文献搜索技巧

- 搜索工具
  - 外文工具
    - 搜索平台: Google Scholar、**DBLP**、等等

<http://dblp.uni-trier.de/>



Michael Ley

The screenshot shows the homepage of the dblp computer science bibliography. At the top, there is a navigation bar with links for 'home', 'browse', 'search', and 'about'. Below the navigation bar is a search bar with the placeholder 'search dblp'. To the left of the search bar is the dblp logo, which consists of three overlapping geometric shapes (blue, yellow, and green) followed by the text 'dblp' and 'computer science bibliography'. A large red dashed rectangle highlights the search bar area. On the left side of the page, there is a sidebar with several browse categories: 'browse authors | editors' (with letters A-Z), 'browse journals' (with letters A-Z), 'browse conferences | workshops' (with letters A-Z), 'browse series' (listing CoRR, LNCS, CEUR-WS, LNEE, IFIP, LNI, EPTCS, LIPICS, other), and 'browse monographs' (listing books & theses, reference works, edited collections). On the right side, there is a section titled 'About dblp' which provides information about the service, mentioning it is a joint service of the University of Trier and Schloss Dagstuhl, and includes a link to the F.A.Q. There is also a section titled 'dblp statistics' with a list of metrics: # of publications: 3,495,783, # of authors: 1,780,555, # of conferences: 4,901, and # of journals: 1,491.

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    - 搜索平台: Google Scholar、DBLP、等等

① dblp.dagstuhl.de/pers/hd/g/Gray:Jim

[+] Jim Gray ▲ ↴ ↵

> Home > Persons

[+] Person information

- affiliation: Microsoft Research
- award: Turing Award, 1998

[+] Other persons with the same name ⓘ

[+] 2010 – today ⓘ

**2010**

■ [j49] Andreas Terzis, Razvan Musaloiu-Elefteri, Joshua Cogan, Katalin Szlavecz, Alexander S. Szalay, Jim Gray, Stuart Ozer, Chieh-Jan Mike Liang, Jayant Gupchup, Randal C. Burns: **Wireless sensor networks for soil science.** IJSNet 7(1/2): 53-70 (2010)

[+] 2000 – 2009 ⓘ

**2008**

■ [j48] Ani R. Thakar, Alexander S. Szalay, George Fekete, Jim Gray: **The Catalog Archive Server Database Management System.** Computing in Science and Engineering 10(1): 30-37 (2008)

■ [j47] Alexander S. Szalay, Ani R. Thakar, Jim Gray: **The sqlLoader Data-Loading Pipeline.** Computing in Science and Engineering 10(1): 38-48 (2008)

■ [j46] Jim Gray: **Distributed Computing Economics.** ACM Queue 6(3): 63-68 (2008)

■ [j45] Jim Gray, Bob Fitzgerald: **Flash Disk Opportunity for Server Applications.** ACM Queue 6(4): 18-23 (2008)

**2007**

■ [j44] Magdalena Balazinska, Armol Deshpande, Michael J. Franklin, Phillip B. Gibbons, Jim Gray, Mark H. Hansen, Michael Liebhold, Suman Nath, Alexander S. Szalay, Vincent Tao: **Data Management in the Worldwide Sensor Web.** IEEE Pervasive Computing 6(2): 30-40 (2007)

**2006**

zoomed in on 110 of 170 records

refine by search term

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- Books and Theses (only)
- Journal Articles (only)
- Conference and Workshop Papers (only)
- Parts in Books or Collections (only)
- Editorship (only)
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select all | deselect all

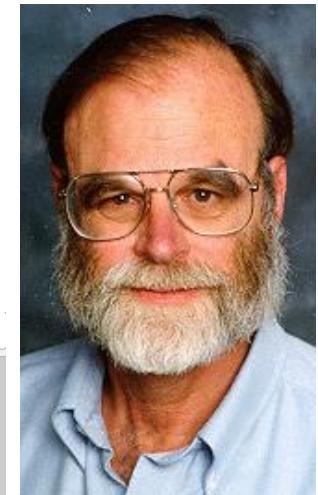
refine by coauthor

- Alexander S. Szalay (14)
- Irving L. Traiger (11)
- Bruce G. Lindsay 0001 (10)
- Raymond A. Lorie (9)
- Gianfranco R. Putzolu (9)
- Michael Stonebraker (8)
- Mike W. Blasgen (7)
- Ani Thakar (7)
- Donald R. Slutz (7)
- David J. DeWitt (7)

... more authors

refine by venue

- SIGMOD Conference (18)
- SIGMOD Record (7)
- Commun. ACM (7)
- VLDB (7)



Jim Gray

# 文献搜索技巧

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。 搜索平台: Google Scholar、DBLP、等等

① dblp.dagstuhl.de/pers/hd/g/Gray:Jim

[+] Jim Gray ↓ ↪ ↵

> Home > Persons

[\[-\] Person information](#)

■ affiliation: Microsoft Research  
■ award: Turing Award, 1998

[\[+\] Other persons with the same name](#) ?

---

[\[-\] 2010 – today](#) ?

**2010**

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[\[-\] 2000 – 2009](#) ?

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**Data Management in the Worldwide Sensor Web.** IEEE Pervasive Computing 6(2): 30-40 (2007)

---

**2006**

■ [j43] ↓ ↪ ↵ Gordon Bell, Jim Gray, Alexander S. Szalay:  
**Petascale Computational Systems.** IEEE Computer 39(1): 110-112 (2006)

■ [c56] ↓ ↪ ↵ Stuart Ozer, Jim Gray, Alexander S. Szalay, Andreas Terzis, Razvan Musaloiu-Elefteri, Katalin Szlavecz, Randal C. Burns, Joshua Cogan:

eye by year grid Dagstuhl

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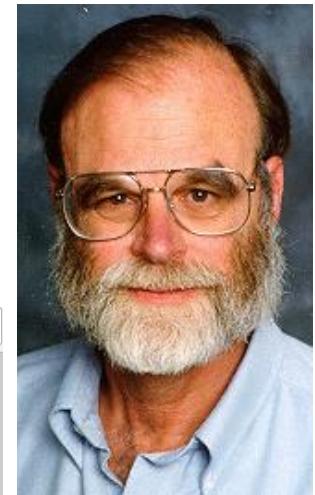
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Ani R. Thakar (1)  
Peter Z. Kunszt (4)  
Donald R. Slutz (2)  
Katalin Szlavecz (2)  
Joshua Cogan (2)  
Maria A. Nieto-Santisteban (2)  
Razvan Musaloiu-Elefteri (2)  
Christopher Stoughton (2)  
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↑



Jim Gray

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    - 搜索平台: Google Scholar、DBLP、等等

① dblp.dagstuhl.de/pers/hd/g/Gray:Jim

[+] Jim Gray ▲ ↴ ↵

> Home > Persons

[+] Person information

- affiliation: Microsoft Research
- award: Turing Award, 1998

[+] Other persons with the same name ⓘ

[+] 2010 – today ⓘ

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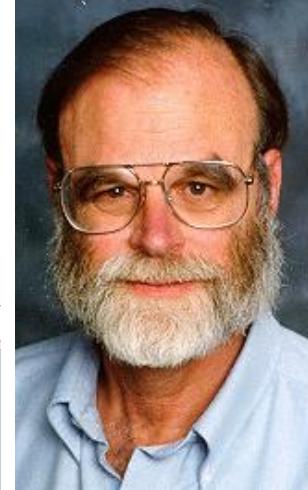
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- Mike W. Blasgen (7)
- Ani Thakar (7)
- Donald R. Slutz (7)
- David J. DeWitt (7)

160 more options

refine by venue

- SIGMOD Conference (18)
- GMCS (7)
- Commun. ACM (7)
- VLDB (7)



Jim Gray

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dblp.dagstuhl.de/pers/hd/g/Gray:Jim

[+] Jim Gray 🔍 ↴ ↵ ↷

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- award: Turing Award, 1998

[+] Other persons with the same name ⓘ

[+] 2010 – today ⓘ

no results

[+] 2000 – 2009 ⓘ

**2006**

■ [c55] 🔍 ↴ ↵ ⓘ Naga K. Govindaraju, Jim Gray, Ritesh Kumar, Dinesh Manocha: **GPUTeraSort: high performance graphics co-processor sorting for large database management.** SIGMOD Conference 2006: 325-336

**2004**

■ [c51] 🔍 ↴ ↵ ⓘ Jim Gray: **The Next Database Revolution.** SIGMOD Conference 2004: 1-4

**2003**

■ [c48] 🔍 ↴ ↵ ⓘ Jim Gray, Hans-Jörg Schek, Michael Stonebraker, Jeffrey D. Ullman: **The Lowell Report.** SIGMOD Conference 2003: 680

**2002**

■ [c47] 🔍 ↴ ↵ ⓘ Alexander S. Szalay, Jim Gray, Ani Thakar, Peter Z. Kunszt, Tanu Malik, Jordan Raddick, Christopher Stoughton, Jan vandenBerg: **The SDSS skyserver: public access to the Sloan Digital Sky Server data.** SIGMOD Conference 2002: 570-581

**2000**

■ [c43] 🔍 ↴ ↵ ⓘ Tom Barclay, Donald R. Slutz, Jim Gray: **TerraServer: A Spatial Data Warehouse.** SIGMOD Conference 2000: 307-318

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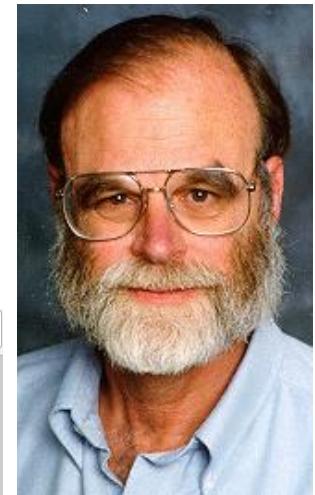
refine by coauthor

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- Alexander S. Szalay (2)
- Peter Z. Kunszt (2)
- Michael Stonebraker (2)
- Tom Barclay (2)
- Patrick E. O'Neil (2)
- Ani Thakar (2)
- Ritesh Kumar (1)
- Jeffrey D. Ullman (1)
- Tanu Malik (1)

30 more options

refine by venue

SIGMOD Conference (18) ✓



Jim Gray

# 课程提纲

---

- 文献搜索

- 众包计算

- 众包简史

- 共享经济

- 核心挑战

- 应用案例

- 区块链

- 总结展望

# 众包简史(1)

## ● 什么是Computer?

- 一种由半导体等电子器件组成的用于高速计算的电子计算机机器。
- Computer一词最早用于一类人员的职业名称(计算员)!
- 例如：NASA以前一种工作职位叫做计算员(Computer)



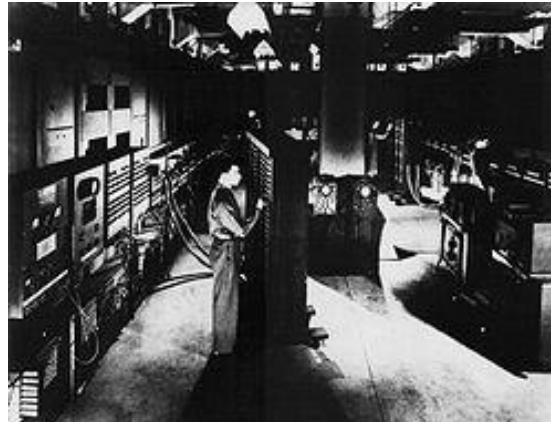
# 众包简史(2)

## ● 计算能力的演化

- 20世纪30-40年代，美国的 Math Table 项目组织大量职员计算导弹轨迹。
- 1946年，人类第一台计算机ENIAC的诞生使得计算能力大幅提升。
- 随着物联网、普适计算、社交媒体计算的普及，移动互联网时代使得人本计算“如影随形”！



Math Table Project



ENIAC, 1946



# 众包简史(3)

## • 人本计算

- 计算机如何依据右侧一组照片中人的“年龄”对照片进行排序呢？
- 通常的排序算法难以完成此项任务！



Noah Kalina's Daily  
Collection

# 众包简史(4)

---

## • 人本计算与众包

- 人本计算(Human Computation) 并非最近新概念，为何众包的概念突然兴起？
- 因为Web时代的到来 (Web的3大特点)：
  - 规则清晰(Clear Rules)
  - 资源丰富(Enough Resources)
  - 沟通迅速(Fast Communication)

# 众包概念

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- 什么是众包(Crowdsourcing) ?
  - 众包是一种分布式的问题求解模式。问题以公开招标的方式发布给未知的解决方案提供者群体。用户(指众包里的“众”)典型地组成在线社区并提交方案。这些最好的方案最后由提出问题的一方(众包人, *crowdsourcer*)所有，并且群“众”中胜出的个人有时会被奖励。(此定义来源于“维基百科”)
  - 简言之，任务通过某种Web平台分包给未知群体的问题求解模式！

# 众包框架

## • 众包与众包平台



Requesters



The screenshot shows the AMT homepage with a search bar and a list of tasks. One task is highlighted:

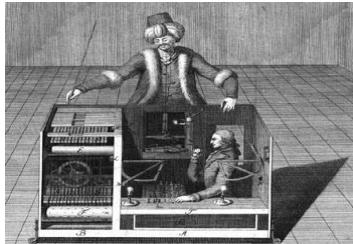
Requester	Offer ID	AMT Expression Date	Time Available	Amount	MTurk Available
Shawn_Turk	10000000000000000000000000000000	Sep 5, 2012 (3 weeks)	30 minutes	\$0.04	\$0.00
Shawn_Turk	10000000000000000000000000000000	Sep 5, 2012 (3 weeks)	30 minutes	\$0.02	\$0.00
Shawn_Turk	10000000000000000000000000000000	Sep 5, 2012 (3 weeks)	30 minutes	\$0.02	\$0.00
Shawn_Turk	10000000000000000000000000000000	Sep 5, 2012 (3 weeks)	30 minutes	\$0.02	\$0.00
Shawn_Turk	10000000000000000000000000000000	Sep 5, 2012 (3 weeks)	30 minutes	\$0.02	\$0.00



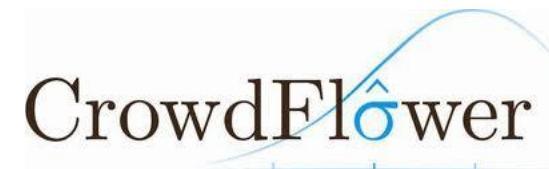
MTurk workers

著名众包平台“Amazon Mechanical Turk (AMT)”通过Web连通着任务的发布者(Requestors)与完成者(Workers)

# 众包平台



AMT



**amazon mechanical turk** Artificial Artificial Intelligence beta

Your Account HITs Qualifications 240,025 HITs available now CAO Chen | Account Settings | Sign Out | Help

All HITs | HITs Available To You | HITs Assigned To You

Find HITs containing [ ] that pay at least \$ 0.00  for which you are qualified  require Master Qualification (60)

**All HITs**  
1-10 of 1351 Results

Sort by: HITs Available (most first)

Show all details | Hide all details 1 2 3 4 5 > Next » Last

Search Google for emails - quick & easy	HIT Expiration Date: Sep 19, 2012 (3 weeks)	Reward: \$0.04	Not Qualified to work on this HIT ( <a href="#">Why?</a> )   View a HIT in this group
Requester: Sebastian Darr	Time Allotted: 30 minutes	HITs Available: 60499	
Search Google for emails - quick & easy	HIT Expiration Date: Sep 19, 2012 (3 weeks)	Reward: \$0.05	Not Qualified to work on this HIT ( <a href="#">Why?</a> )   View a HIT in this group
Requester: Sebastian Darr	Time Allotted: 30 minutes	HITs Available: 28441	
Find phone number, social media accounts and website addresses	HIT Expiration Date: Sep 10, 2012 (1 week 5 days)	Reward: \$0.05	Not Qualified to work on this HIT ( <a href="#">Why?</a> )   View a HIT in this group
Requester: Richard Payne	Time Allotted: 10 minutes	HITs Available: 17518	
Keyword Search - Quick and Simple! (US)	HIT Expiration Date: Aug 29, 2013 (52 weeks)	Reward: \$0.16	Not Qualified to work on this HIT ( <a href="#">Why?</a> )   View a HIT in this group
Requester: CrowdSource	Time Allotted: 32 minutes	HITs Available: 14977	

# 众包的相关概念

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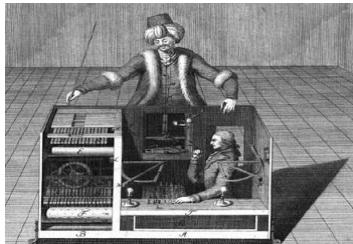
- 众包 vs. 外包 (Outsourcing)
  - 众包的任务和问题是外派给不确定的群体；
  - 外包的任务和问题是外派给确定的个体。
- 众包 vs. 开源 (Open Source)
  - 参与者动机不同：众包参与者多看重直接或间接受益（钱或者奖励）；开源参与者参与动机为反垄断；
  - 问题来源不同：众包问题源于众包提出人；而开源问题来自于开源团队成员的共同志愿。

# 第一代：基于Web的众包应用平台

- 广义的众包平台



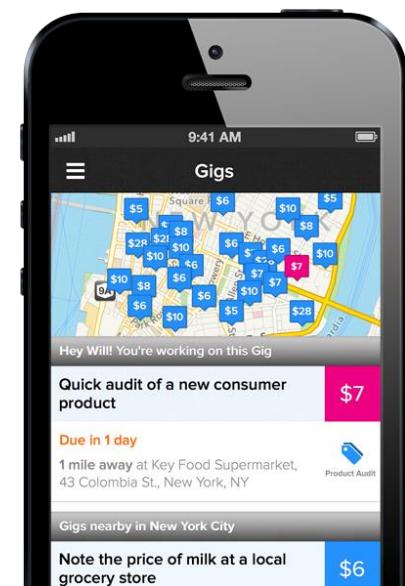
- 专用的众包平台



AMT



# 第二代：时空众包应用平台



# 课程提纲

---

- 文献搜索

- 众包计算

- 众包简史
- 共享经济
- 核心挑战
- 应用案例
- 区块链

- 总结展望

# 共享经济

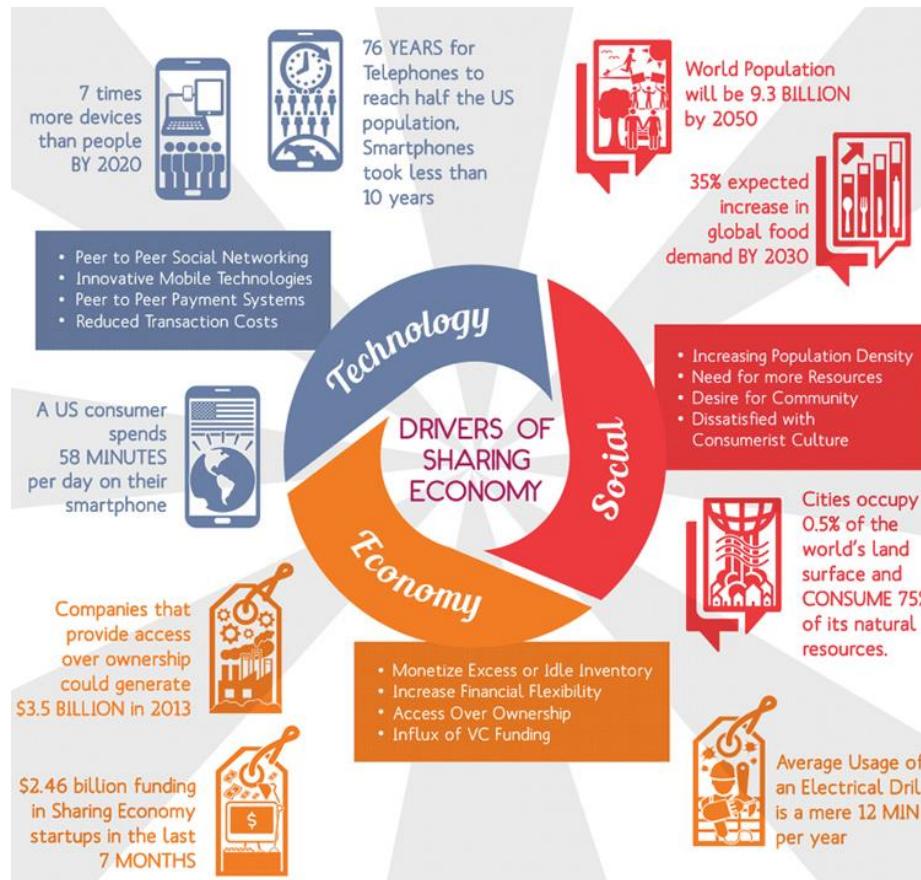
## ● 共享经济

- 通过整合线下的闲散物品或服务资源，使得需求方以较低价格通过租借等共享方式使用物品，而不直接拥有物品的所有权。（百度百科）



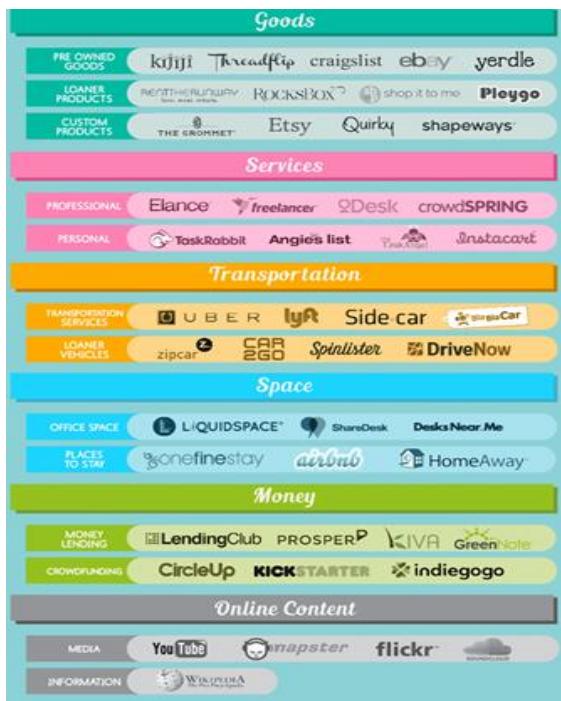
# 共享经济现状

- 美国《时代周刊》统计，在美国提供共享经济类服务公司在2013年产生350亿美元的红利
- 在美国仅2014年上半年，新注入到共享经济类创业公司的风险投资额为25亿美元



# 共享经济应用示范

- 产业服务遍布百姓“衣食住行”的各个领域
  - 共享出行：Uber与滴滴出行
  - 共享住宿：Airbnb
  - 共享餐饮：Eatwith与百度外卖等



国外应用



国内应用

# 课程提纲

---

- 文献搜索

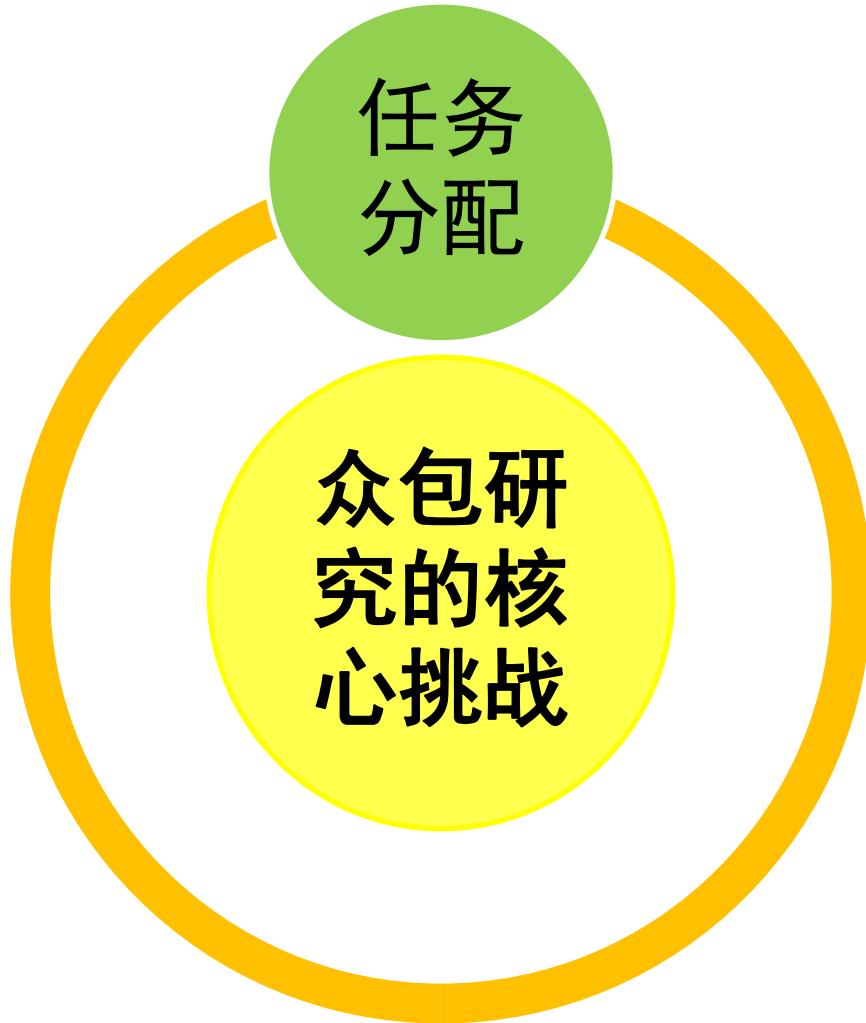
- 众包计算

- 众包简史
- 共享经济
- 核心挑战
- 应用案例
- 区块链

- 总结展望

# 众包研究的核心挑战

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# 众包研究的核心挑战(1)

---

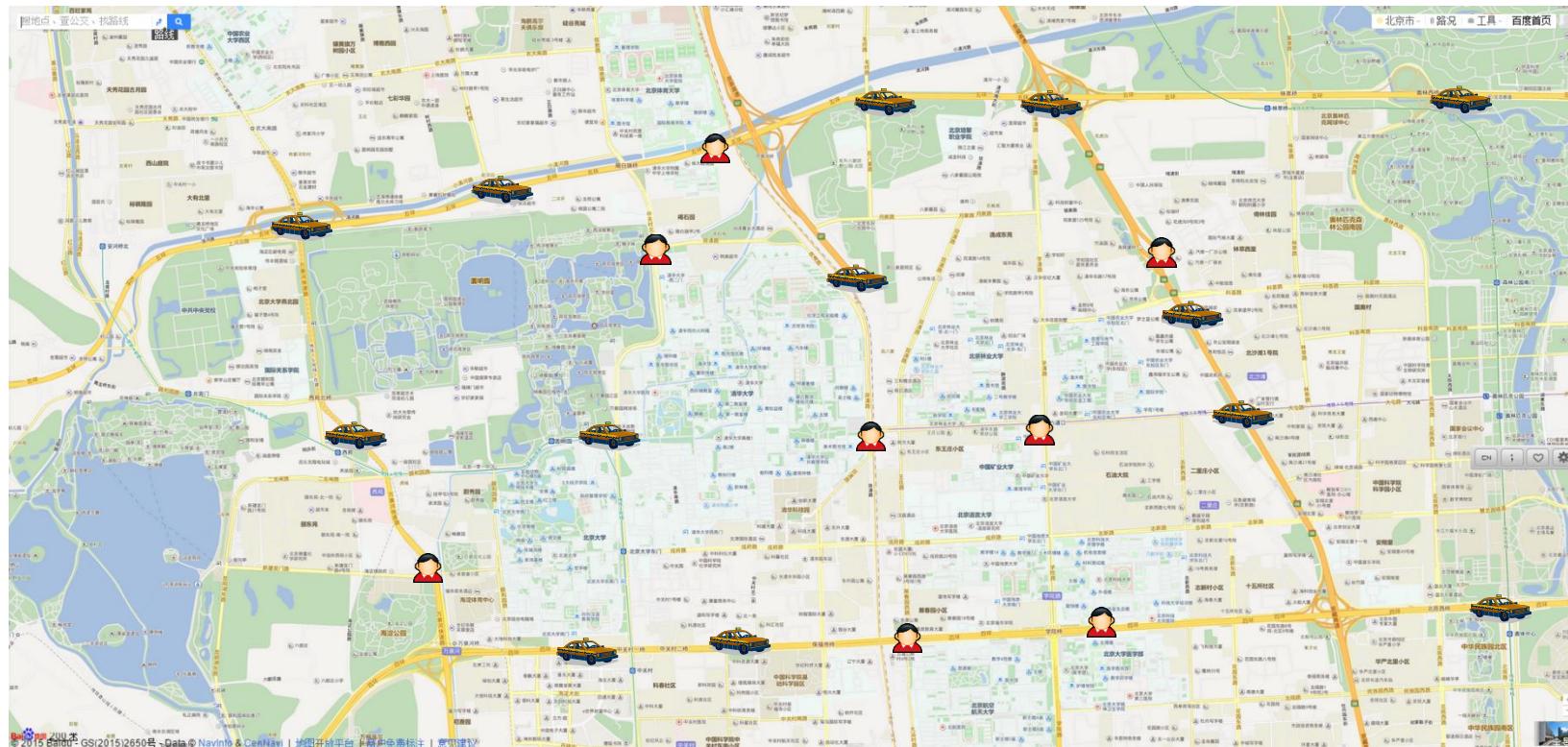
## • 任务分配

- 实时性与动态性
- 信息不完整性

# 众包研究的核心挑战(1)

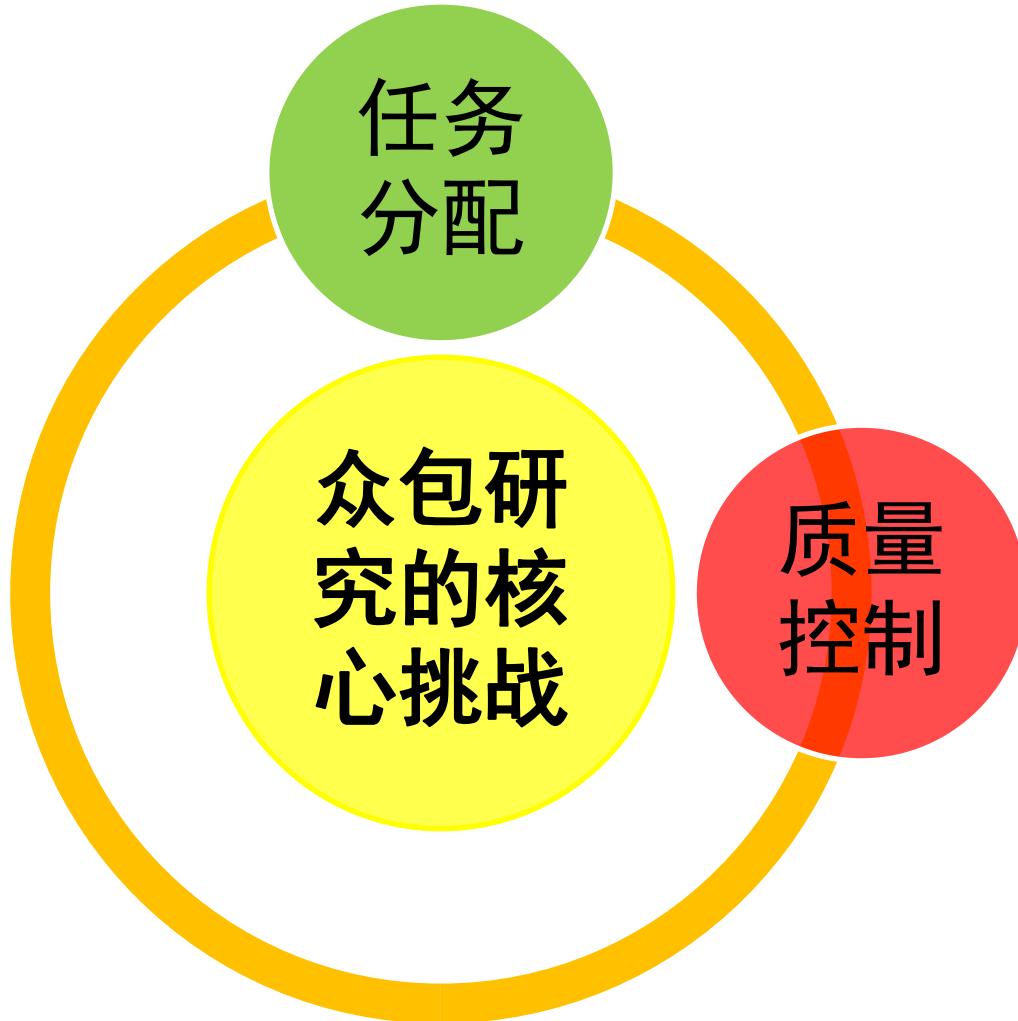
## • 任务分配

- 实时性与动态性
- 信息不完整性
- 实时专车系统实例



# 众包研究的核心挑战

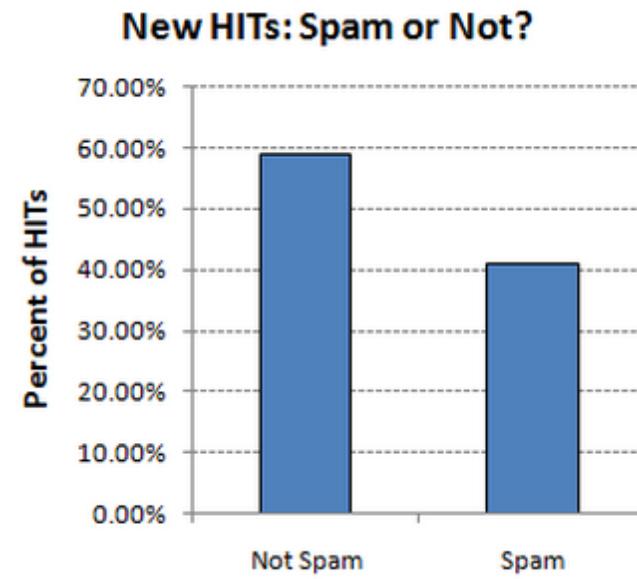
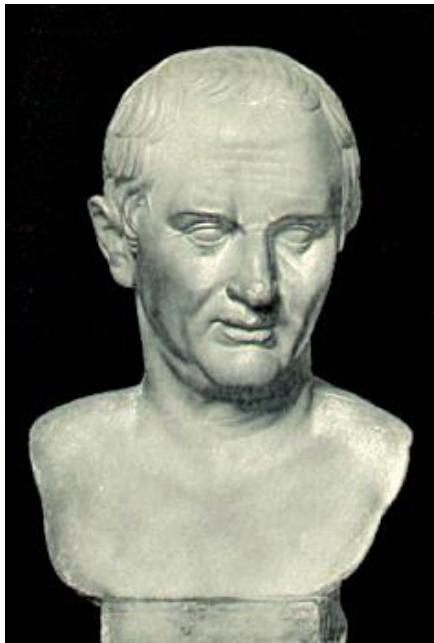
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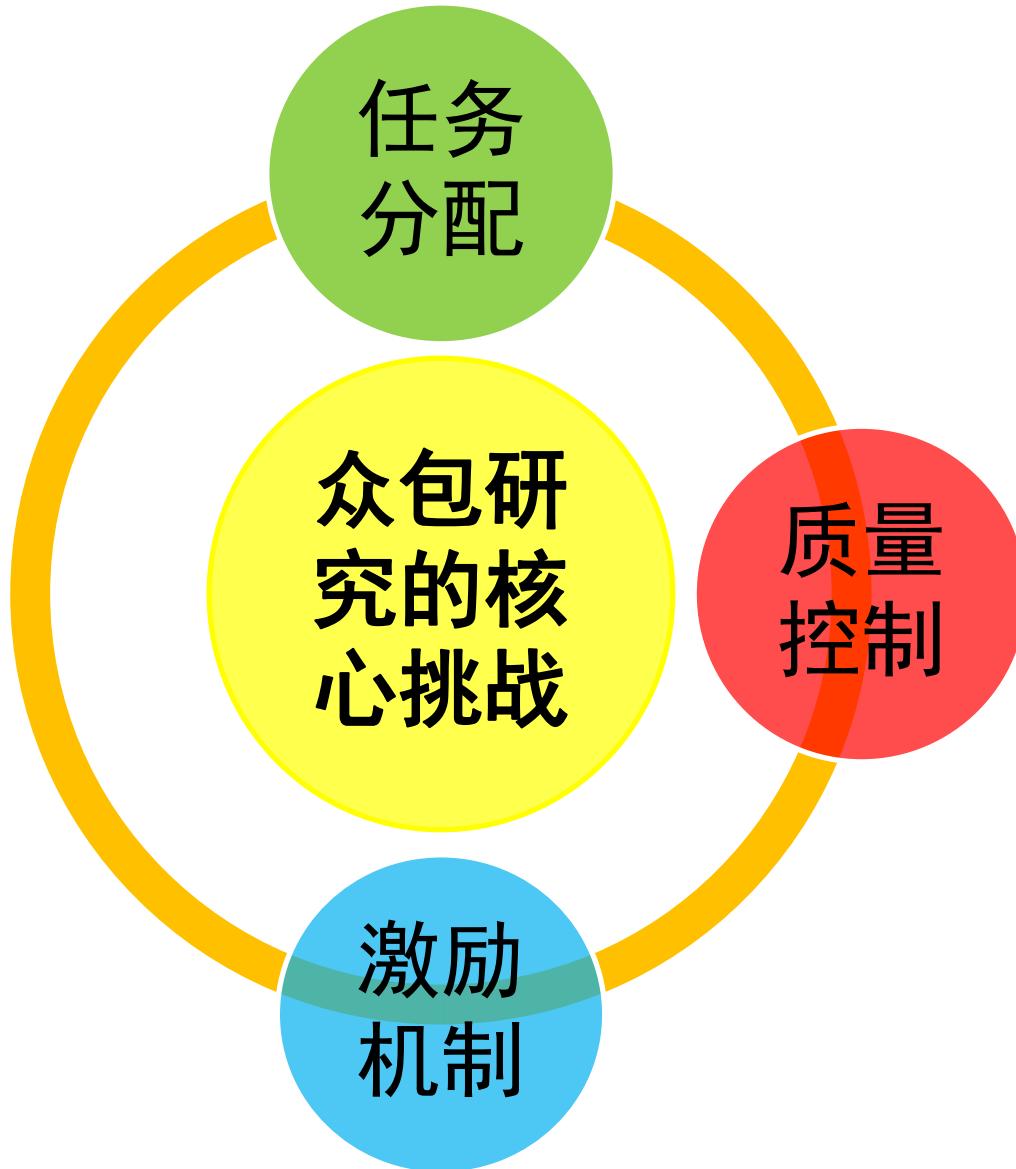
# 众包研究的核心挑战 (2)

## • 质量控制

- 正如哲学家西塞罗 (Cicero) 所说“人类难免犯错”，因此不同众包结果的质量应如何甄别？
- 如何有效地集成对同一问题的群体反馈，并剔除“水军”实非易事。



# 众包研究的核心挑战



# 众包研究的核心挑战 (3)

## • 激励机制

- 利他主义(Altruistic) ?
- 财富收益?
- 个人兴趣?

他们这样推广APP

我也需要

APP推广

悬赏: ￥1000 ios游戏测试, 每条下载5元  
ArnXu 发布 246投标

悬赏: ￥3000 Android手机游戏下载注册...  
ArnXu 发布 592投标

悬赏: ￥3600 ios游戏下载, 每条3元  
ArnXu 发布 217投标

来自“威客网”

WIKIPEDIA

The image shows the Wikipedia homepage with a large globe icon. Below it, the English version is highlighted, showing "The Free Encyclopedia" and "4 240 000+ articles". Other languages listed include Russian (1 000 000+ статей), German (1 590 000+ Artikel), Polish (970 000+ haset), Portuguese (780 000+ artigos), and many others like Spanish, French, Italian, and Chinese.

Select the correct image

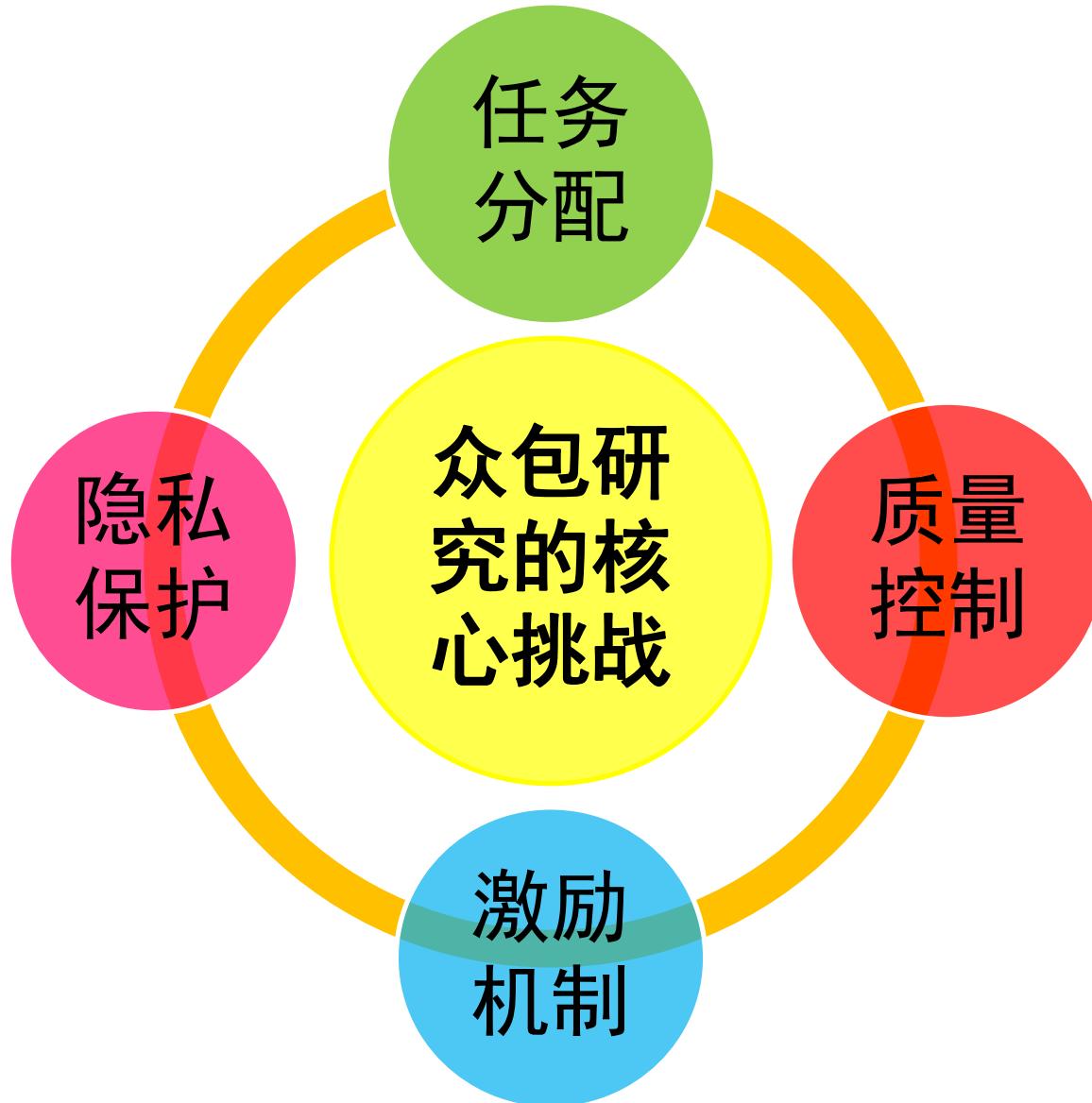
“the egg”

1 el huevo      2 la sopa      3 la pasta

通过Duolingo.com自发学习西班牙语

维基百科

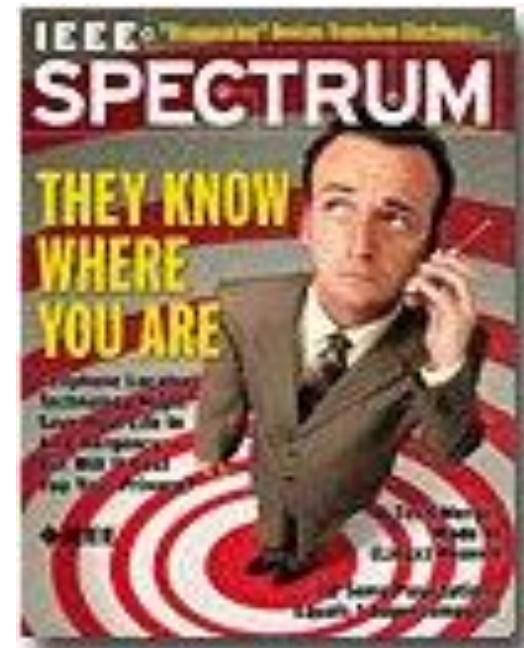
# 众包研究的核心挑战



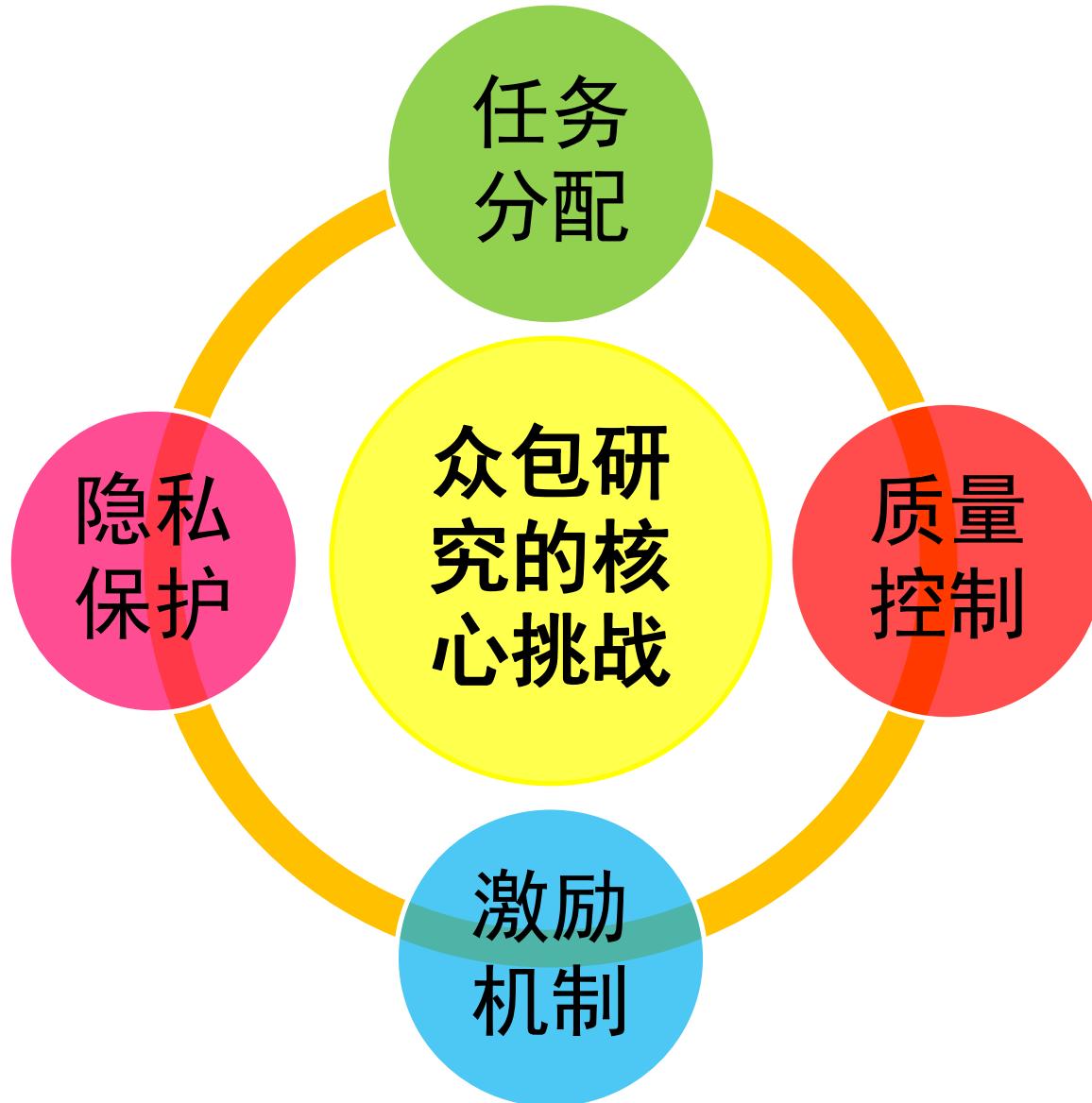
# 众包研究的核心挑战(4)

## • 隐私保护

- 移动互联网、物联网与普适计算技术的“双刃剑”效果
- 如何平衡任务分配效果与众包参与者隐私保护这两者之间的关系？



# 众包研究的核心挑战



# 课程提纲

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- 文献搜索

- 众包计算

- 众包简史
- 共享经济
- 核心挑战
- 应用案例

- 区块链

- 总结展望

# 应用案例(1)：众包OCR

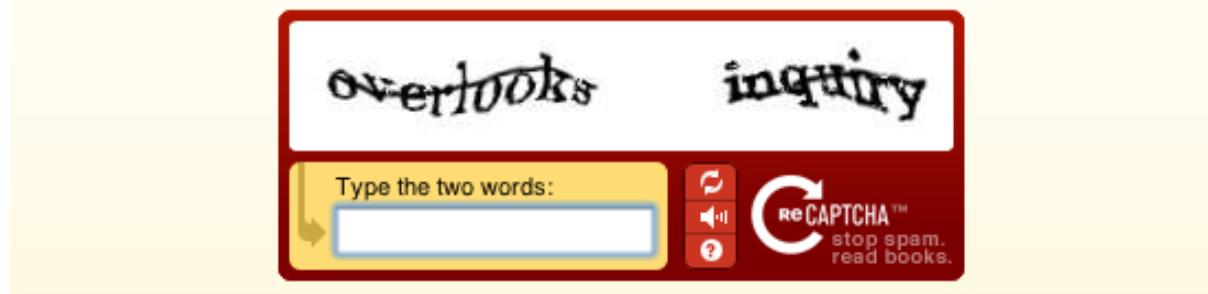
## • reCAPTCHA项目

- 系统目标：

- 识别输入者是人类还是机器(因为已知其中一个字符串，其被用来测试)。
- 完成了纽约时报中大量古老存档文献的数字化。
- 人类任务：输入系统给定的2个“不清晰”的字符串。

### Telling Humans and Computers Apart Automatically

A CAPTCHA is a program that can generate and grade tests that humans can pass but current computer programs cannot. For example, humans can read distorted text as the one shown below, but current computer programs can't.

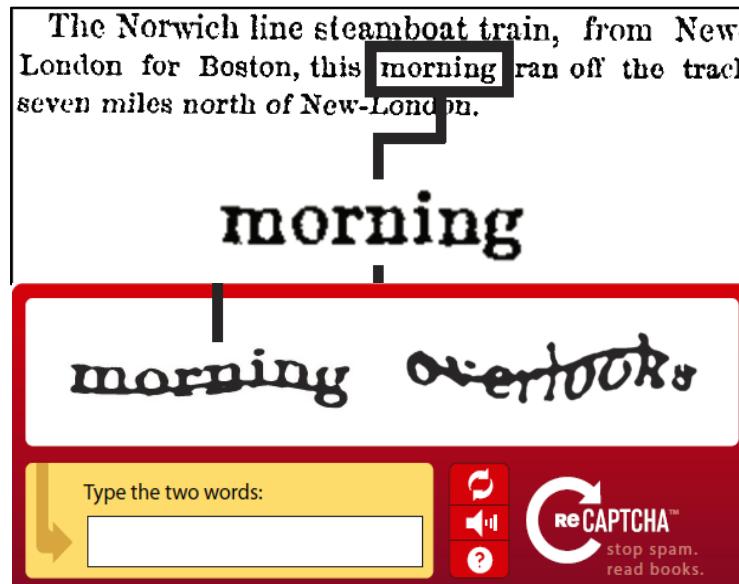


# 众包计算的应用案例(1)

## • reCAPTCHA项目

### • 系统目标:

- 识别输入者是人类还是机器(因为已知其中一个字符串，其被用来测试)。
- 完成了纽约时报中大量古老存档文献的数字化。
- 人类任务：输入系统给定的2个“不清晰”的字符串。



# 应用案例(1)：众包OCR

# • 佛经的数字化与古汉语理解

- Optical Character Recognition (OCR)

- 基于众包的佛经标注
  - 基于众包的通假字识别



# 龙泉寺主持学诚法师

大何以故雖能施於二種人目此人唯各獲一世利又肉眼性性有敗壞永劫無上慧眼慧眼之性歷劫無壞何以故福報人天之中恣意受樂無窮無盡畢成佛道所以者何由出家法滅魔眷屬增益佛種摧滅惡法長養善法滅除罪垢興無上福業是故佛說出家功德高於湏弥深於大海廣於虛空若使有人為出家者作諸惡投其中此人罪報亦復如是一切留難令不從志其罪甚重如夜黑闇无所覩見是人罪報亦復如是入深地獄黑闇無目僻如大海江河百流悉投其中此人罪報亦復如是一切諸惡皆集其身如湏弥山刲火所燒若等斤兩比於石竈彼善惡報亦復無有遺餘此人亦尅地獄火燒無有窮已辟如迦留樓醯尼藥極為毒苦以出家人以修多羅為水洗結使之垢能滅除生死之苦為涅槃之因以毗尼為足踐淨戒之地阿毗曇為目視世善惡恣意遊步八正之路至涅槃

大何以故雖能施於二種人目此人  
唯各獲一世利又肉眼性性有敗壞  
聽人出家若自出家展轉示道衆生  
永劫無上慧眼慧眼之性歷劫無壞  
何以故福報人天之中恣意受樂无  
窮無盡畢成佛道所以者何由出家  
法滅魔眷屬增益佛種摧滅惡法長  
養善法滅除罪垢興無上福業是故  
佛說出家功德高於湏跡深於大海  
廣於虛空若使有人為出家者作諸  
留難令不從志其罪甚重如夜黑闇  
无所覩見是人罪報亦復如是入深  
地獄黑闇無目僻如大海江河百流  
患投其中此人罪報亦復如是一切  
諸惡皆集其身如湏跡山劫火所燒  
元有遺餘此人亦入地獄火燒無有  
窮已辭如迦留樓醯尼藥極為毒苦  
若等併兩比於石室彼善惡報亦復  
如是聽人出家若自出家功德取大  
以出家人以修多羅為水洗結使之  
垢能滅除生死之苦為涅槃之因以  
毗尼為足踐淨戒之地阿毗曇為目  
視世善惡恣意遊步八正之路至涅

## ● 象形类古汉文的语义理解

# 宋代《高丽藏》石刻版

# 应用案例(2)：图像标注

## ● ESP游戏(Luis von Ahn教授)

- 游戏目标：图像标注
- 人类任务：两位独立的玩家需同时猜对相同对象，游戏才结束。



PLAYER 1



GUESSING: CAR

GUESSING: HAT

GUESSING: KID

SUCCESS!  
YOU AGREE ON CAR

PLAYER 2



GUESSING: BOY

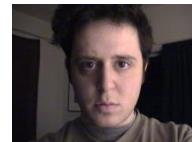
GUESSING: CAR

SUCCESS!  
YOU AGREE ON CAR

# 应用案例(3)：众包排序

## • 基于众包的排序操作

- 计算机如何依据右侧一组照片中人的“年龄”对照片进行排序呢？
- 通常的排序算法较难完成此项任务！



Noah Kalina's Daily  
Collection

# 应用案例(3)：众包排序

- 基于众包的排序操作

- 计算机如何依据右侧一组照片中人的“年龄”对照片进行排序呢？
- 通常的排序算法较难完成此任务！
- 若给定任务所包含照片数量如此巨大，则可对众包任务进行合理拆分并进一步汇聚结果。



# 应用案例(4)：专家发现

- 微博空间中的可靠用户发现
  - 在微博平台上提问“能否在半小时内从北航新主楼驾车至颐和园？”



“是 or 否？”



- 哪位用户或哪个群体用户的反馈是“可靠”的？

# 应用案例(4)：专家发现

- 今年香港国际电影节的会场在哪里？

Andy Lau



Cecilia Cheung



Nicholas Tse



Jackie Chan



“HK Coliseum”

“? ? ?”

“Hong Kong  
Cultural Centre”

“HK Coliseum”

# 应用案例(4)：专家发现

- 大数据技术下一个应用热点是什么？

Andy Lau



“? ? ?”

Cecilia Cheung



“? ? ?”

Nicholas Tse



“? ? ?”

Jackie Chan



“? ? ?”

C. Cao, Y. Tong, L. Chen. Whom to Ask? Jury Selection for Decision Making Tasks on Microblog Services. In VLDB 2012.

# 应用案例(5)：众包地图

## • OpenStreetMap

- 地图领域的“维基百科”
- 伦敦大学学院与帝国理工学院研发
- 地图精准度不下于“谷歌地图”
- 产生一些有趣的科学发现

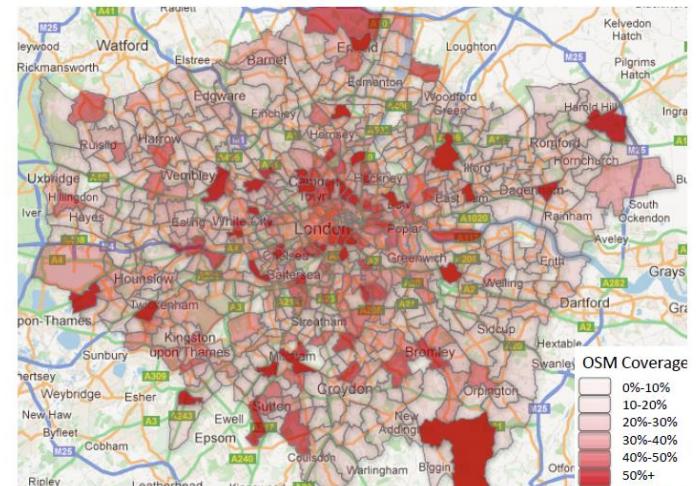
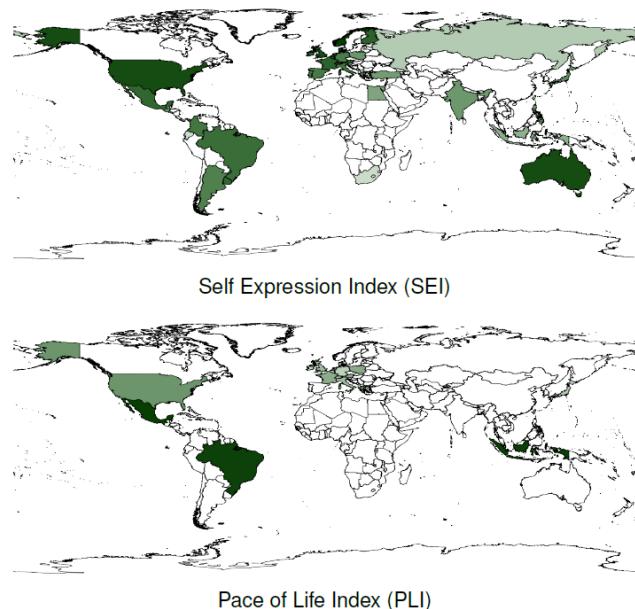


Figure 4. Choropleth map of OSM coverage for Greater London-Darker wards have higher coverage

# 课程提纲

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- 文献搜索
- 众包计算
- 区块链
- 总结展望

# 什么是货币

---

- 交换媒介
- 具有面额
- 某人所有

## Definition of money (n)

[bing.com](#) · Bing Dictionary

**mon·ey** [ múnnee ] 

1. medium of exchange: a medium of exchange issued by a government or other public authority in the form of coins of gold, silver, or other metal, or paper bills, used as the measure of the value of goods and services
2. denomination: a form or denomination of coin or paper money
3. somebody's coins and bills: the amount of coins and bills in somebody's possession

Synonyms: [cash](#), [currency](#), ready money, [ready cash](#), [change](#), [ready](#), coins, [coinage](#), [dosh](#), [greenbacks](#), [dough](#), [bread](#), [bucks](#)

# 什么是货币



WIKIPEDIA  
The Free Encyclopedia

## Money

From Wikipedia, the free encyclopedia

*For other uses, see [Money \(disambiguation\)](#).*

**Money** is any object or record that is generally accepted as [payment](#) for [goods](#) and [services](#) and repayment of [debts](#) in a given socio-economic context or [country](#).<sup>[1][2][3]</sup> The main functions of money are distinguished as: a [medium of exchange](#); a [unit of account](#); a [store of value](#); and, occasionally in the past, a [standard of deferred payment](#).<sup>[4][5]</sup> Any kind of object or secure verifiable record that fulfills these functions can be considered money.

# 什么是货币



WIKIPEDIA  
The Free Encyclopedia

## Money

From Wikipedia, the free encyclopedia

*For other uses, see [Money \(disambiguation\)](#).*

**Money** is any object or record that is generally accepted as [payment](#) for [goods](#) and [services](#) and repayment of [debts](#) in a given socio-economic context or [country](#).<sup>[1][2][3]</sup> The main functions of money are distinguished as: a [medium of exchange](#); a [unit of account](#); a [store of value](#); and, occasionally in the past, a [standard of deferred payment](#).<sup>[4][5]</sup> Any kind of object or secure verifiable record that fulfills these functions can be considered money.

- 数量有限
- 广泛接受
- 便于交换

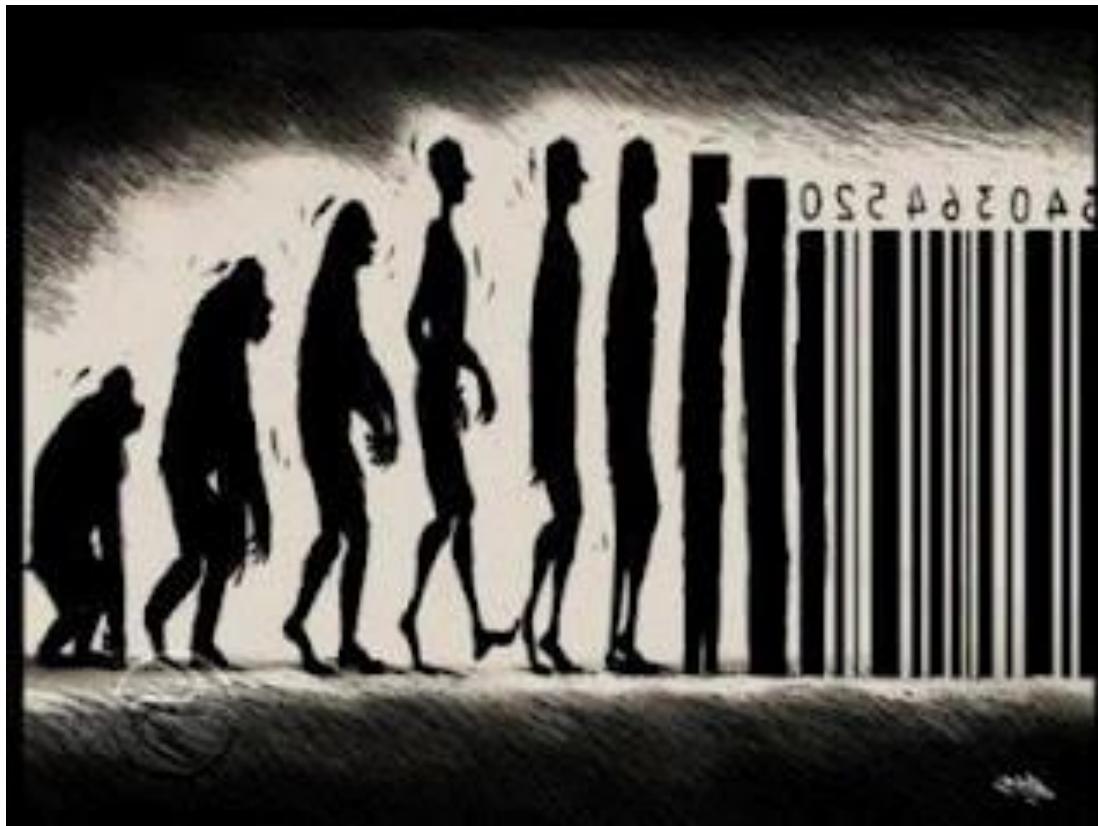
# 什么是货币



# 电子货币的发展

---

- 非常简单
- 比较困难



# 电子货币的发展

- 非常简单：朴素的方法



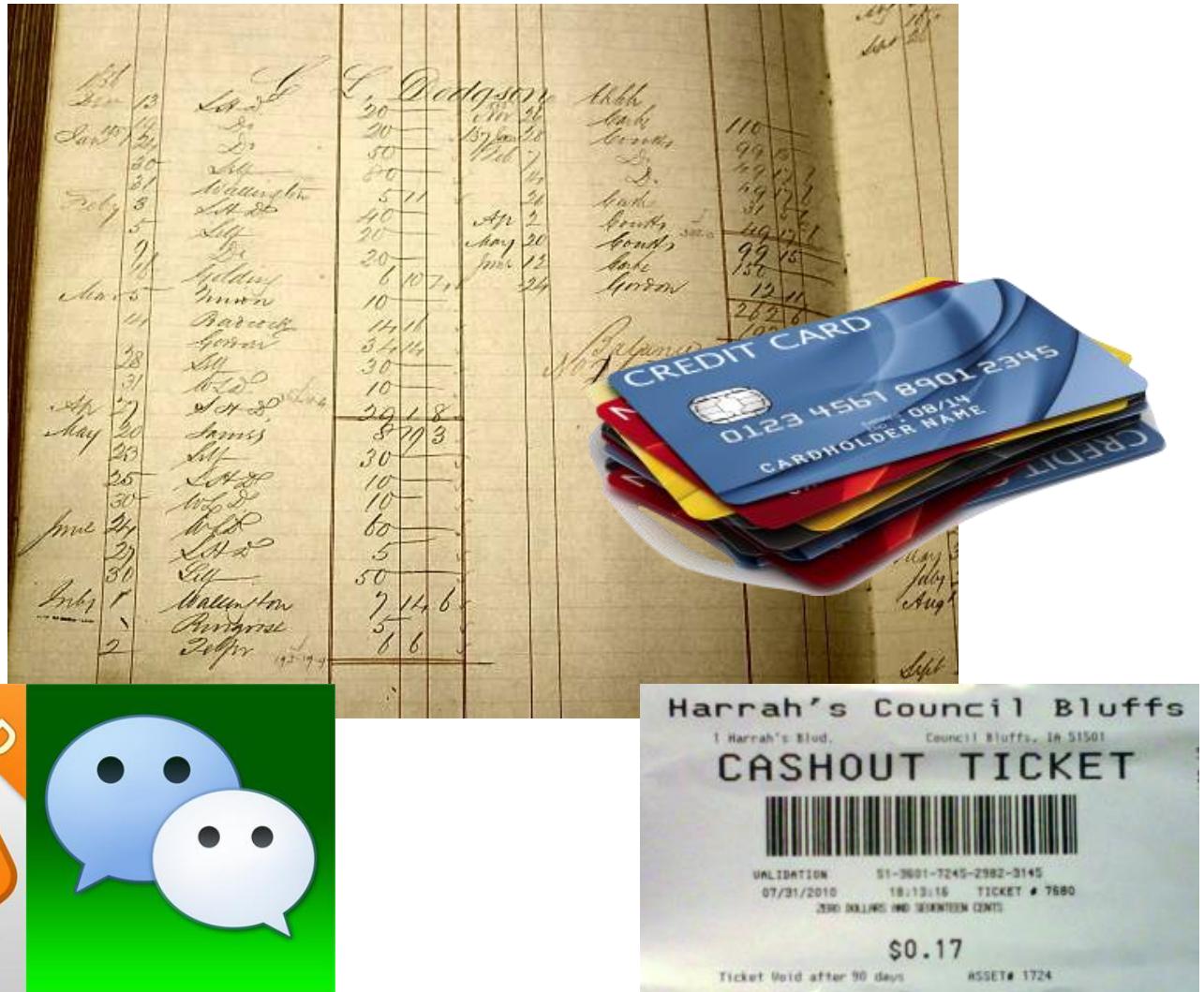
# 电子货币的发展

- 比较困难：基于记账的方法



# 电子货币的发展

- 比较困难：基于记账的方法



# 电子货币的挑战

- 基于“中心化”的信任机制
  - 以银行为“中心化”可信机制
  - 可信的第三方机构与银行交互
  - 否则，不可信则存在大量风险



# 电子货币的挑战

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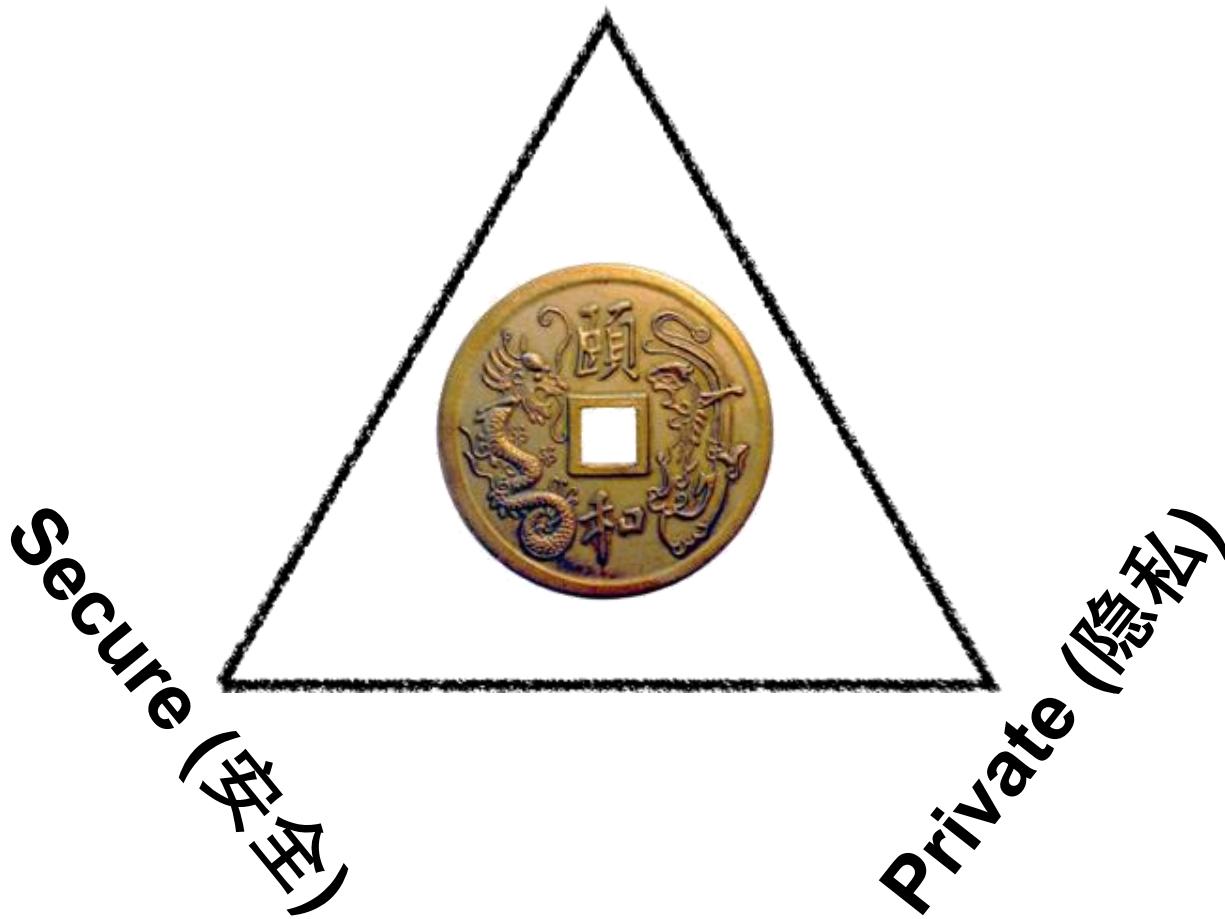
- 基于“中心化”的信任机制
  - 以银行为“中心化”可信机制
  - 可信的第三方机构与银行交互
  - 否则，不可信则存在大量风险
- 隐私保护
  - 银行对每笔交易记录都是可见的！



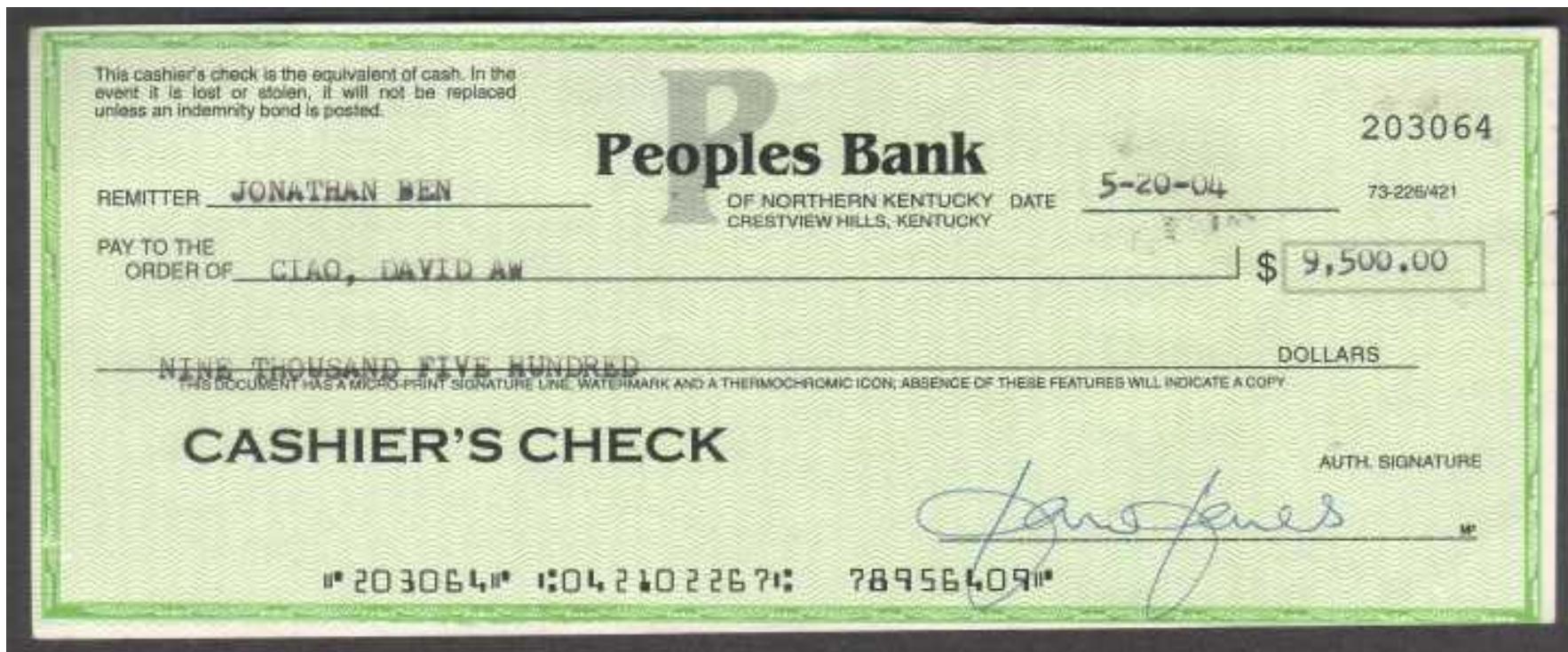
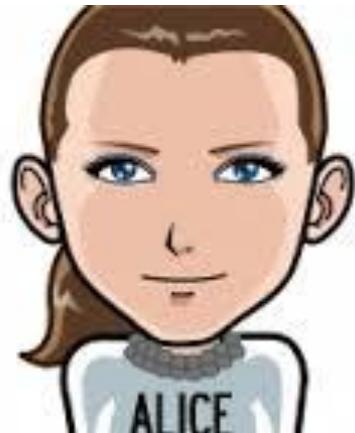
# 理想的电子货币现实吗？

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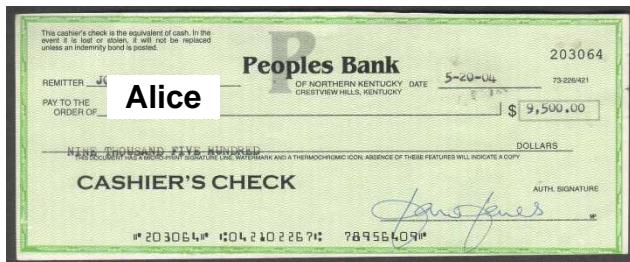
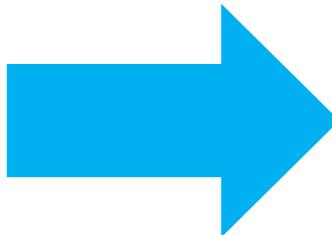
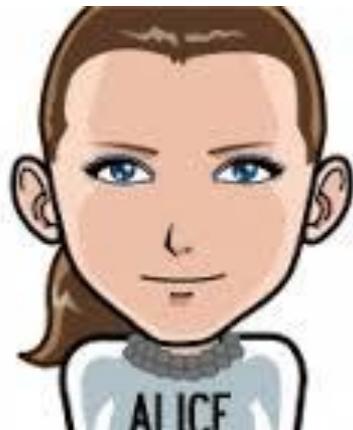
Decentralized (去中心化)



# 去中心化的风险：双重支付



# 去中心化的风险：双重支付



能否采用“去中心化”的电子货币数字化这个过程呢？

ENDORSE CHECK HERE

Pay to the order of Bob

Alice

DO NOT WRITE, STAMP OR SIGN BELOW THIS LINE

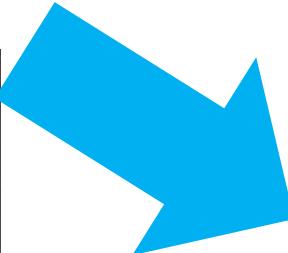
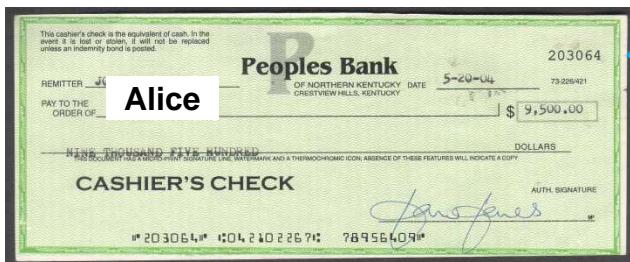
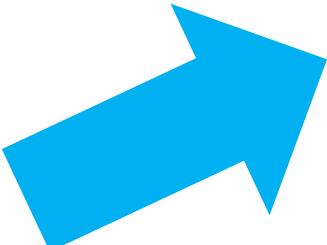
# 去中心化的风险：双重支付

- 电子货币的方法

- Alice用户名作为“公钥”
- Alice的签名作为“数字签名”



# 去中心化的风险：双重支付



ENDORSE CHECK HERE

Pay to the order  
of Bob

Alice

DO NOT WRITE, STAMP OR SIGN BELOW THIS LINE



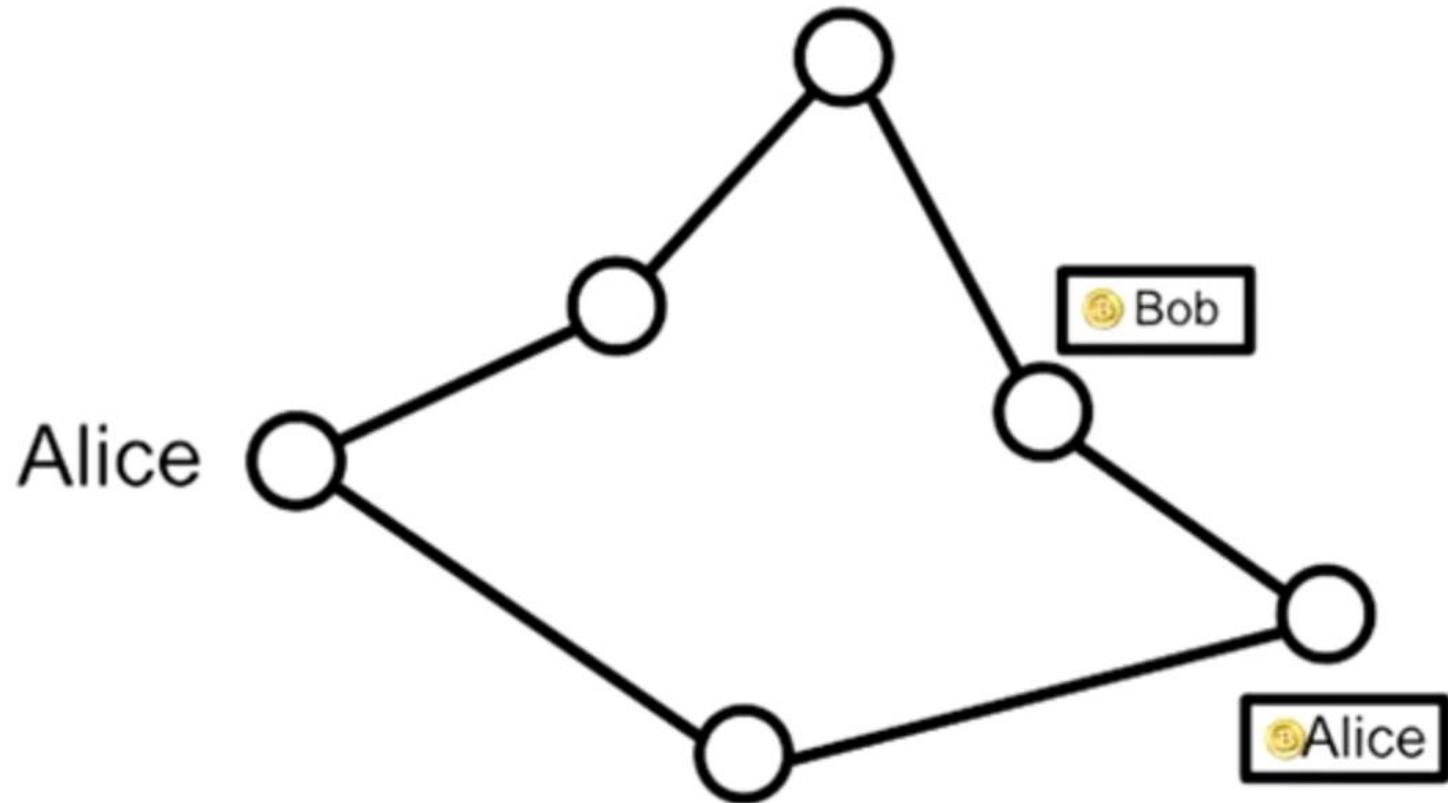
ENDORSE CHECK HERE

Pay to the order  
of Alice

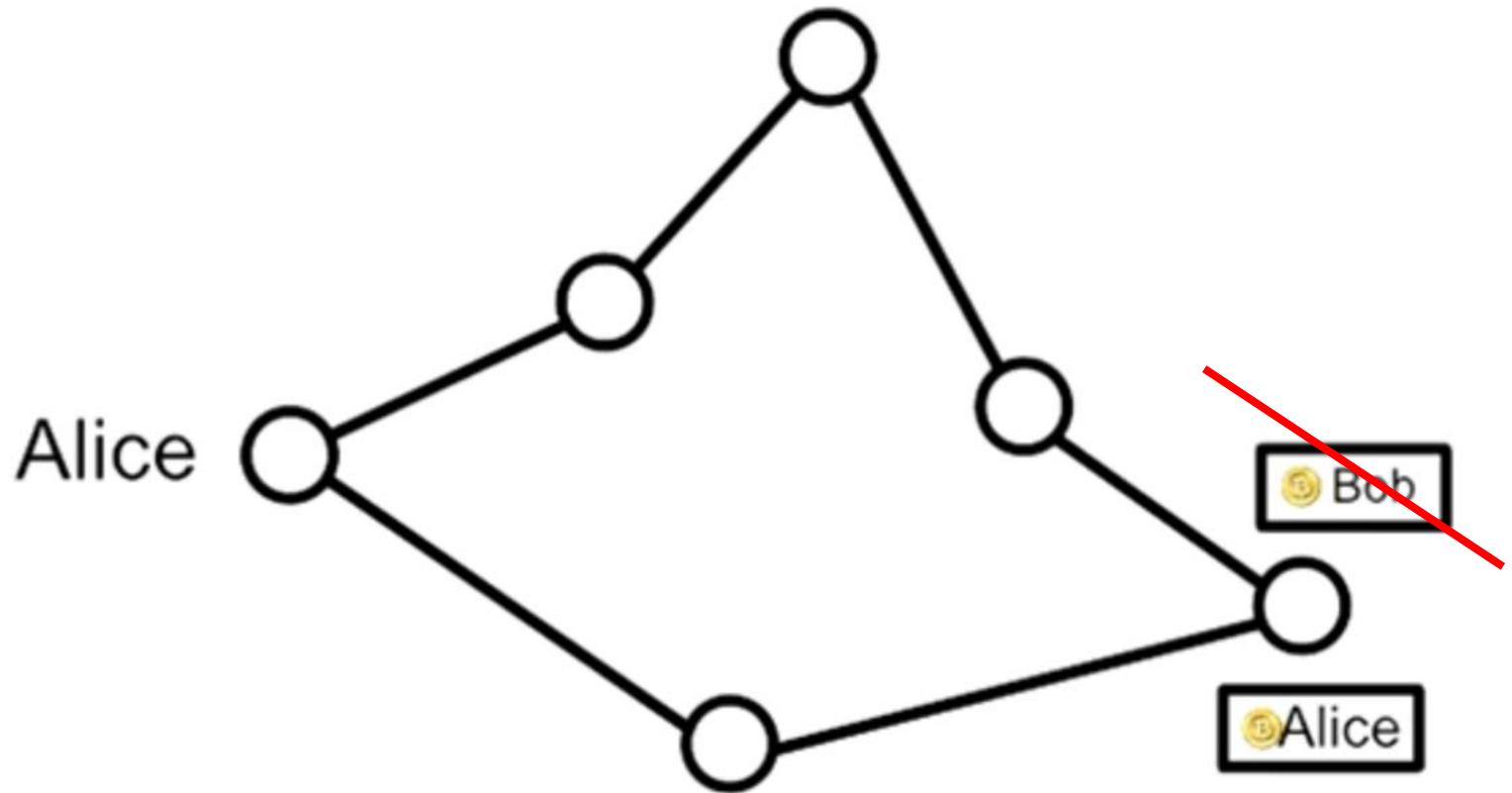
Alice

DO NOT WRITE, STAMP OR SIGN BELOW THIS LINE

# 去中心化的风险：双重支付

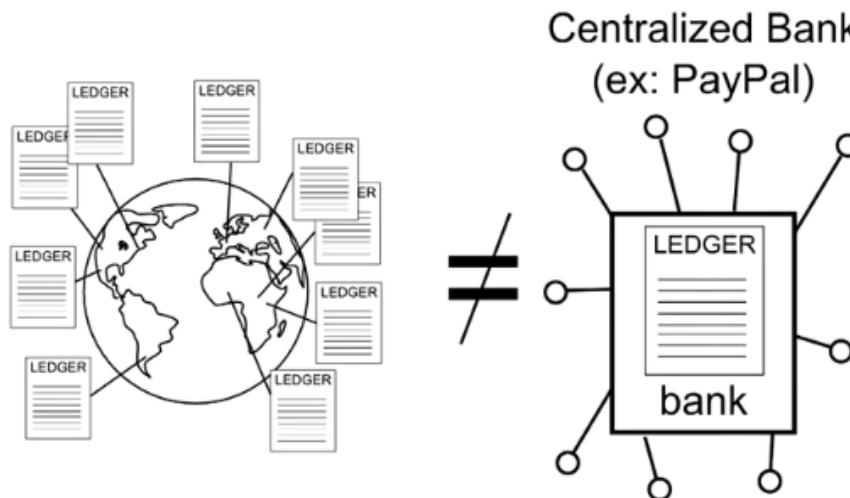


# 去中心化的风险：双重支付

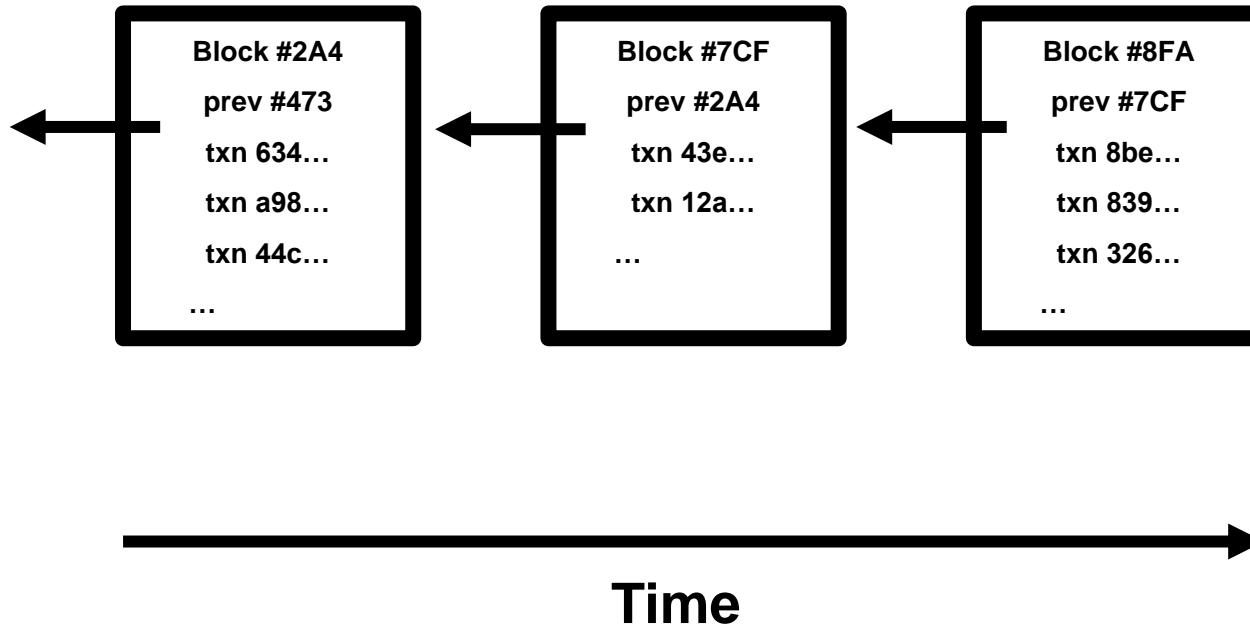


# 解决双重支付：比特币的区块链

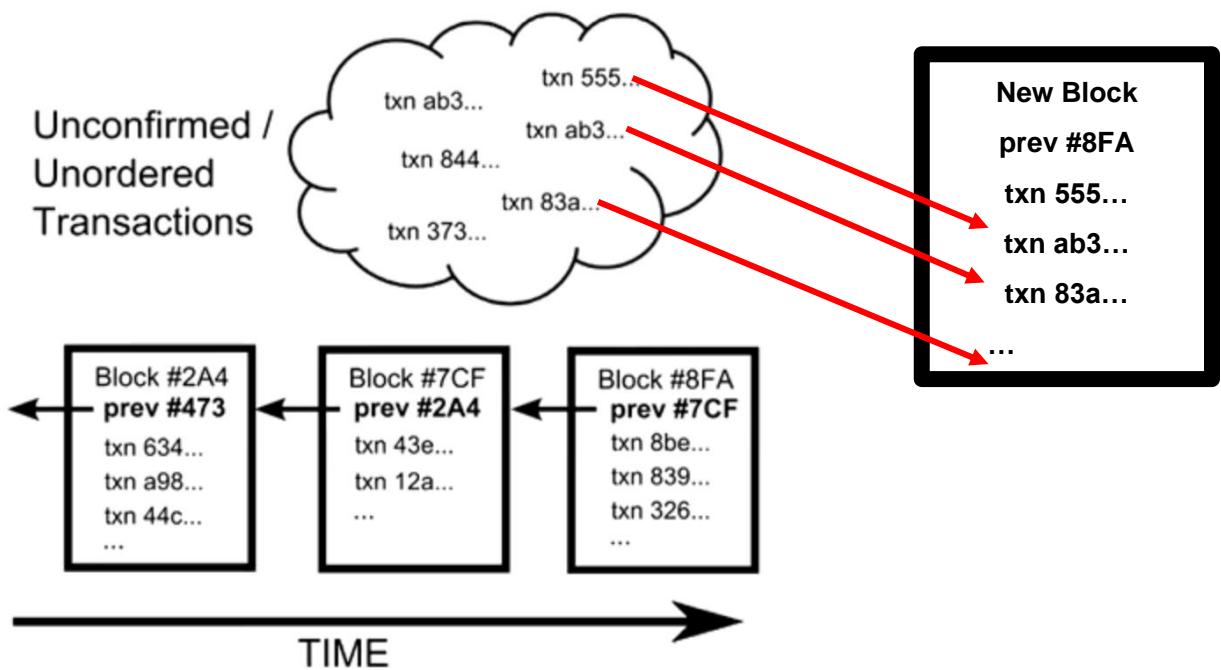
- 比特币可视为一个关于用户账户与交易记录的“**分布式电子账本**”
- 它的副本被存在比特币网络中的每一个计算节点之中，但是该网络**不存在**所谓的“**中心化计算节点**”！



# 解决双重支付：比特币的区块链



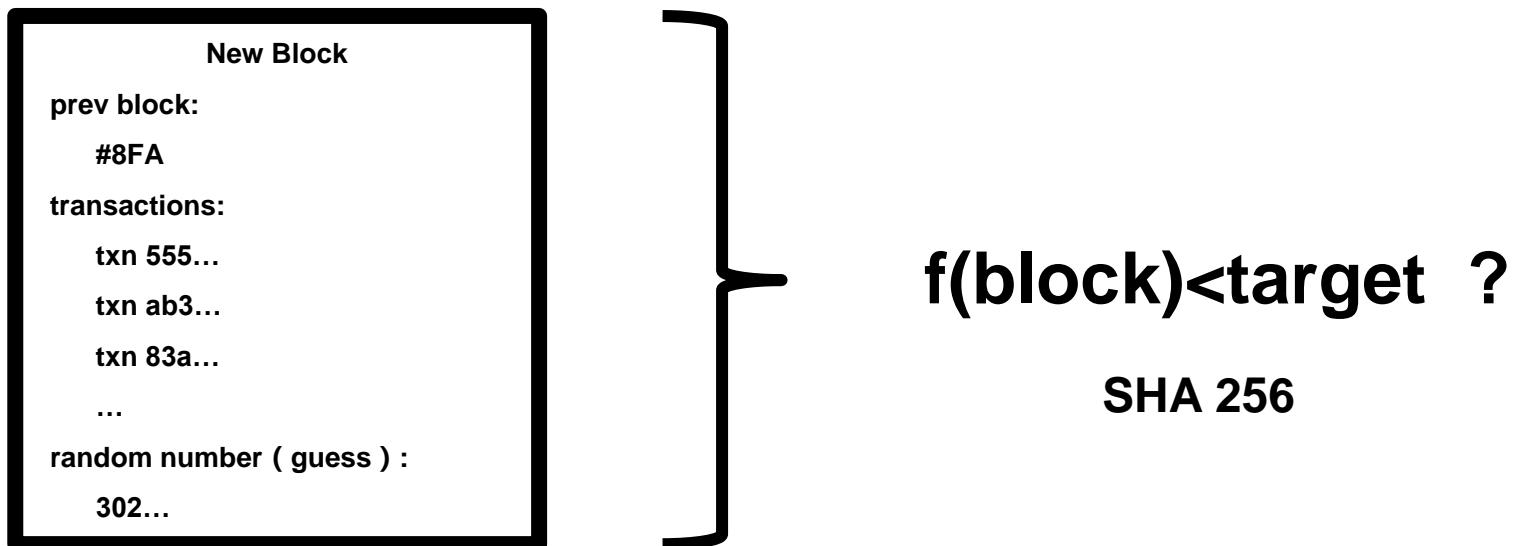
# 区块链：创建区块



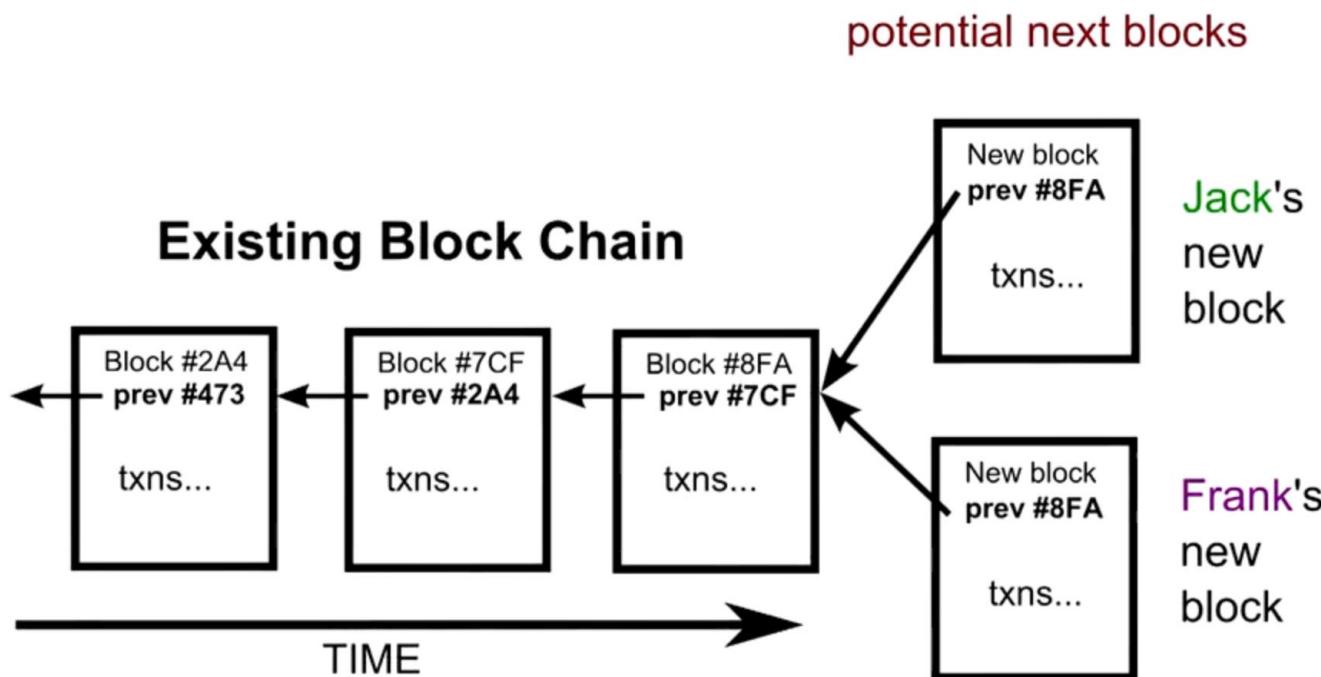
# 区块链：创建区块

- 产生新区块

- 网络内全部计算节点(群众)计算一个难解问题
- 谁先解出问题，区块由谁创建
- 平均每10分钟创建一个区块

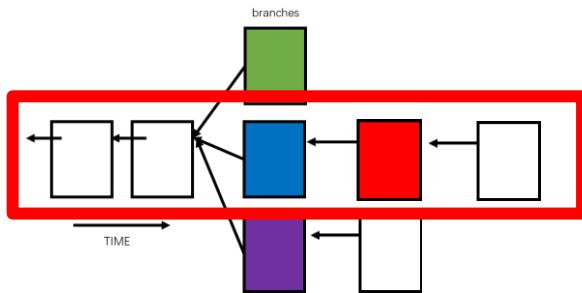


# 区块链：区块冲突

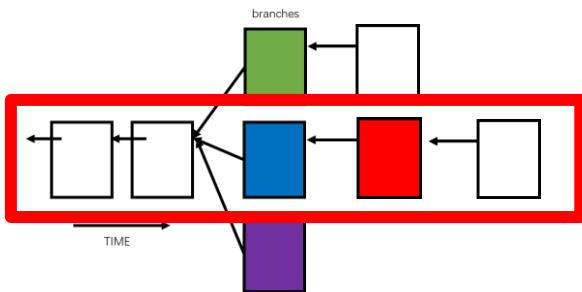


# 区块链：区块冲突

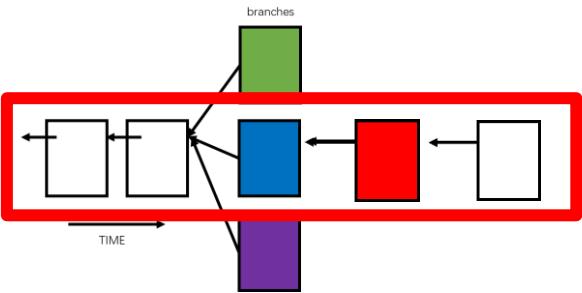
Alice's  
Block Chain



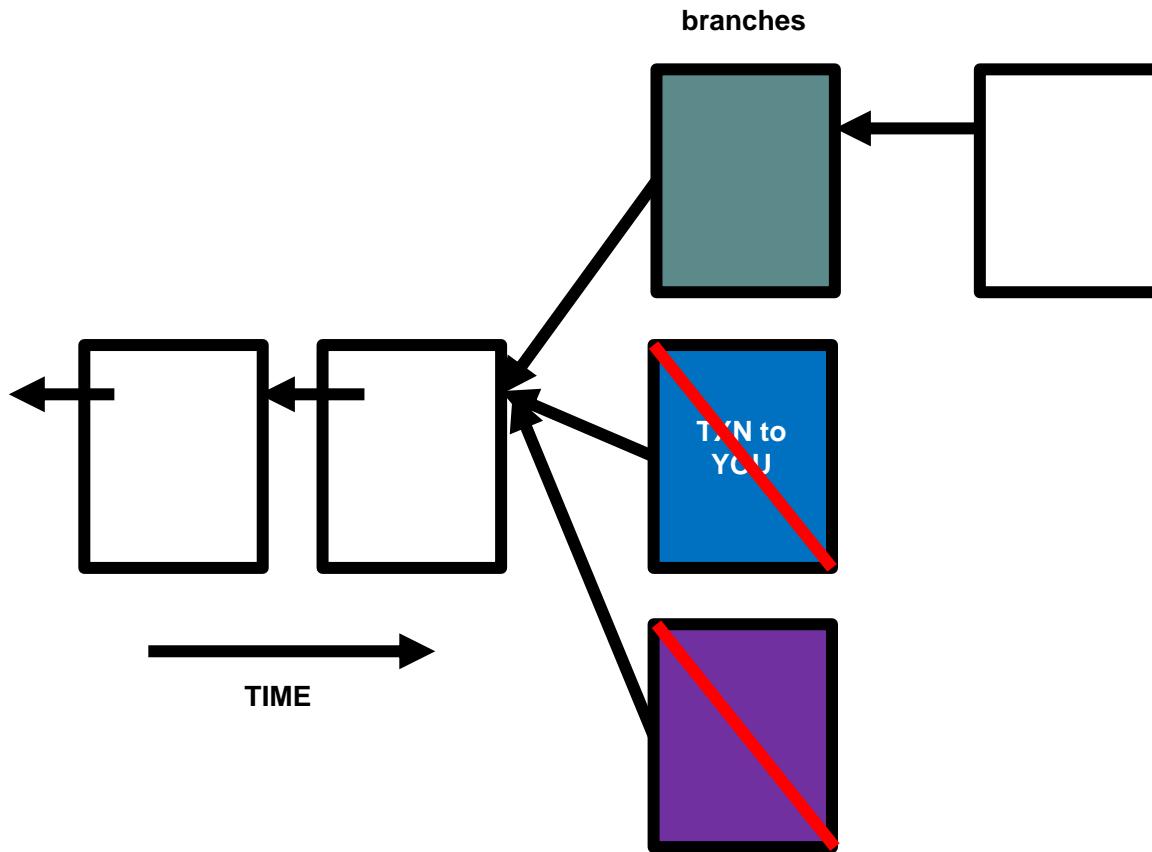
Your  
Block Chain



Bob's  
Block Chain



# 区块链：区块冲突



比特币网络认为：当一个区块随后又链接了6个区块，则该区块已被网络确认。换言之，此区块以极高的概率与网络中其他节点达成一致，从而解决了双重支付问题！

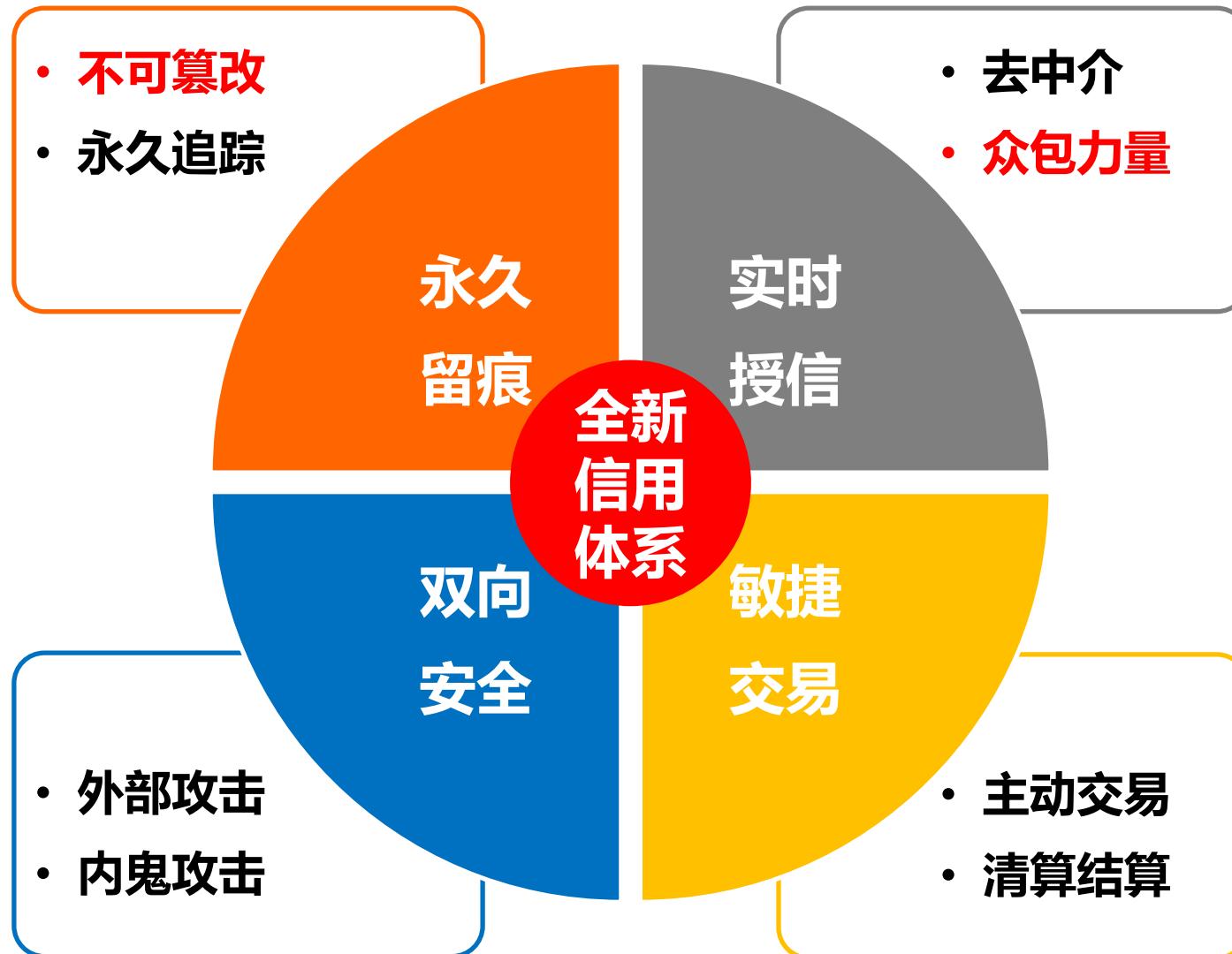
# 区块链的认识误区

- 比特币的法律问题：洗钱，非法货币
- 区块链离不开比特币？
- 区块链完全不需要依赖比特币而存在！

 *bitcoin* ≠



# 区块链的总结



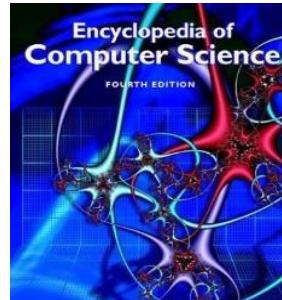
# 课程提纲

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- 文献搜索
- 众包计算
- 区块链
- 总结展望

# 总结与展望

- 科技领域众包：百科全书 vs. 维基百科



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Deutsch	Die freie Enzyklopädie 1 590 000+ Artikel	Français	L'encyclopédie libre 1 390 000+ articles
Polski	Wolna encyklopedia 970 000+ haser	Italiano	L'encyclopédia libera 1 030 000+ voci
Português	A encyclopédia livre 780 000+ artigos	中文	自由的百科全書 690 000+ 條目

- 众包计算更是“共享经济”的计算范式
  - “共享经济模式”遍及当今百姓们“衣食住行”



衣

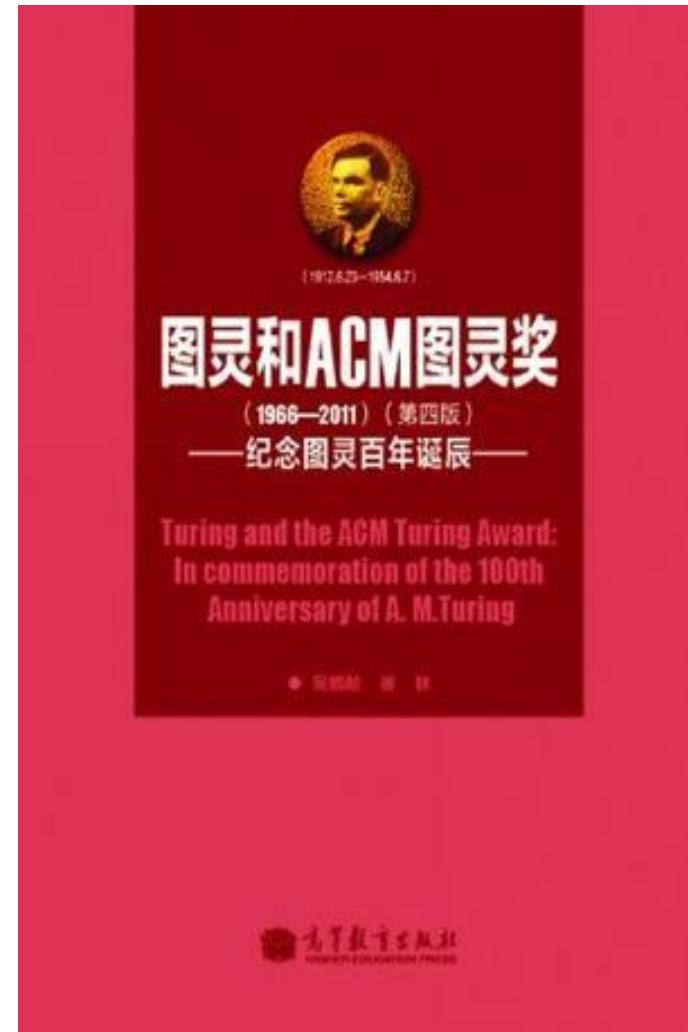
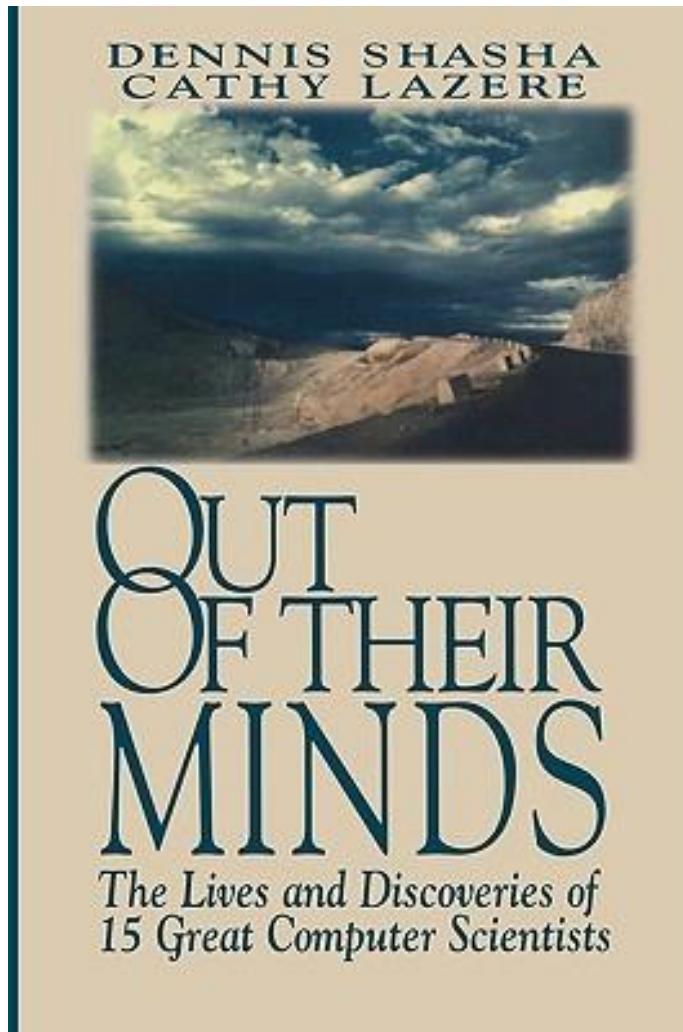
食

住

行

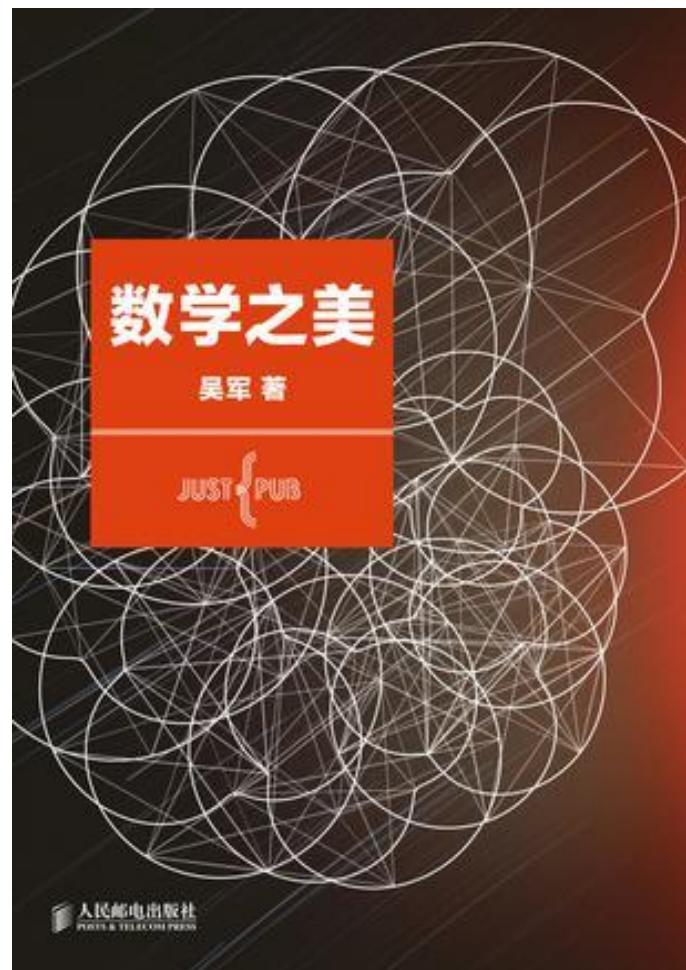
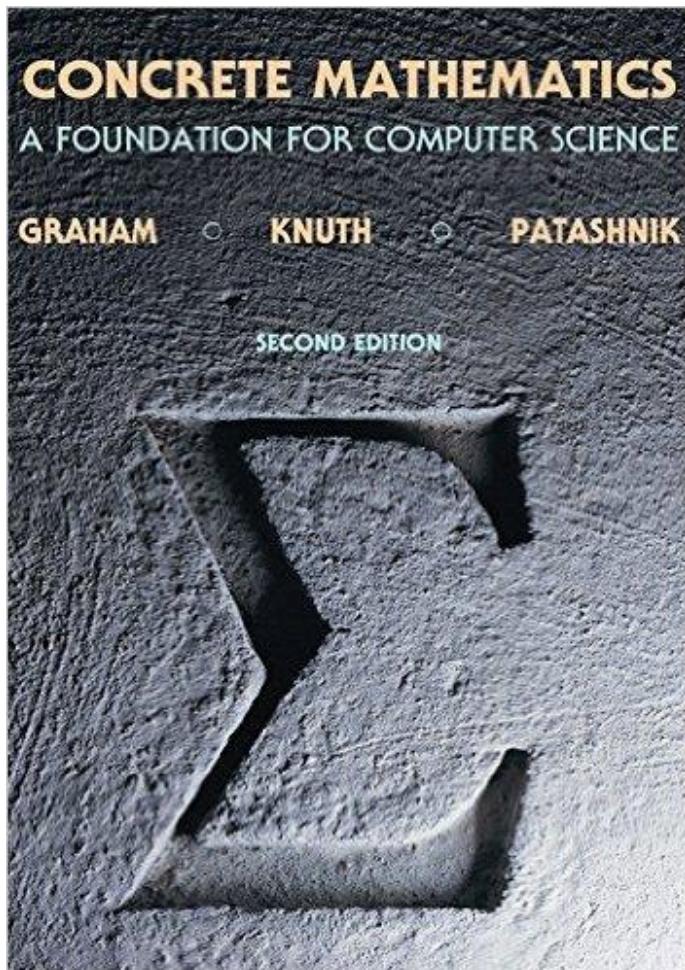
# 计算机基础书籍推荐

- 计算机发展史（图灵奖传记类）



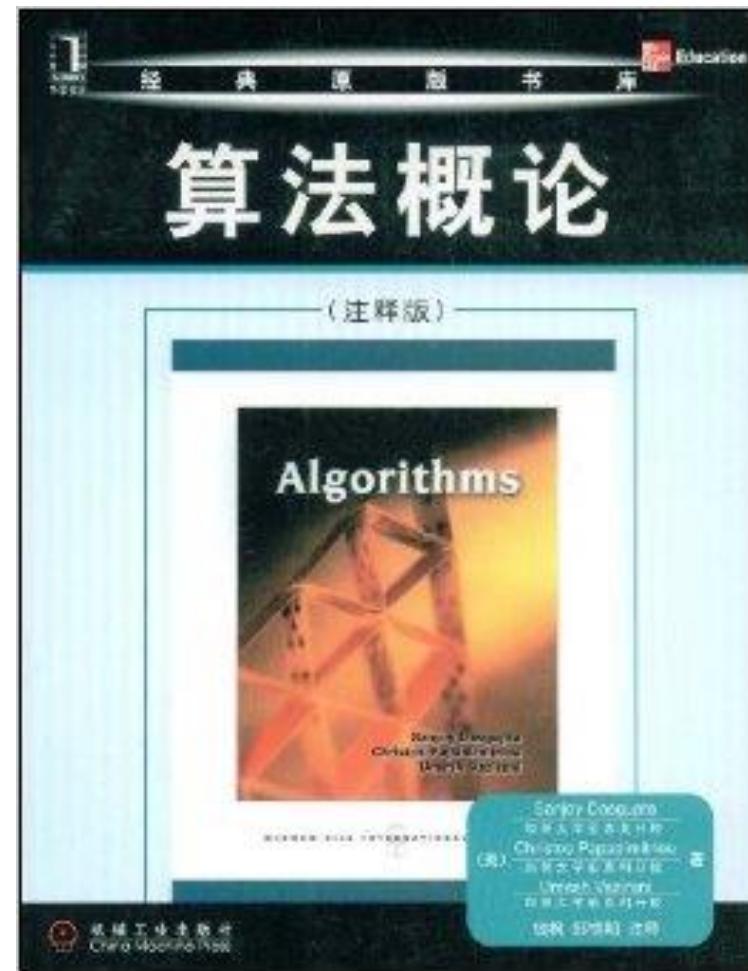
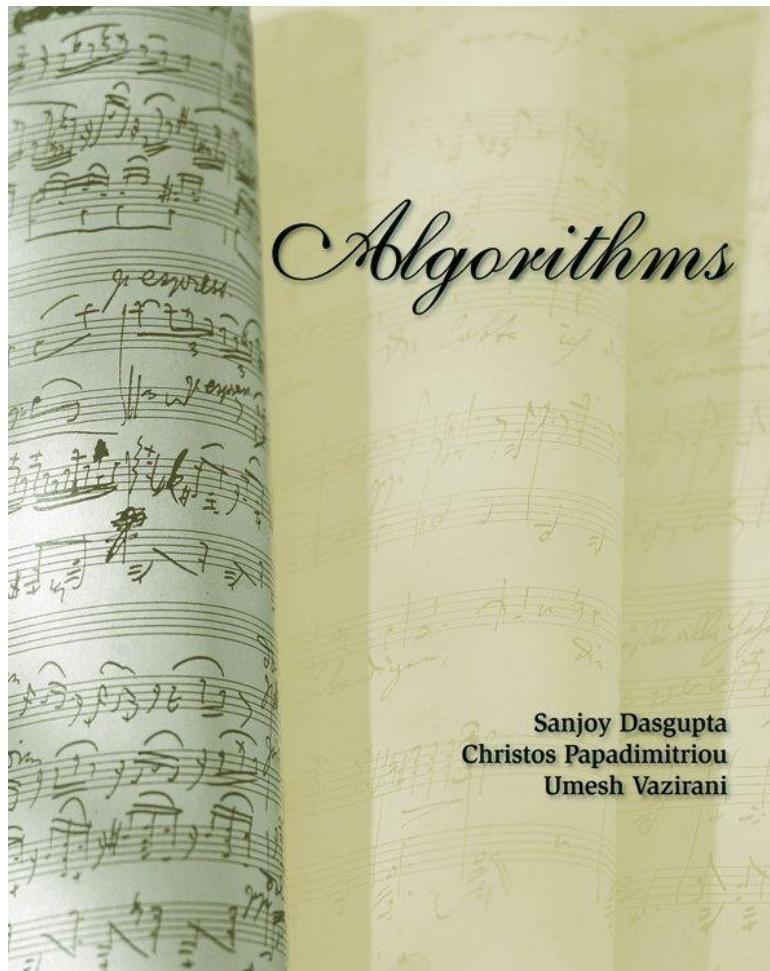
# 计算机基础书籍推荐

- 数学基础



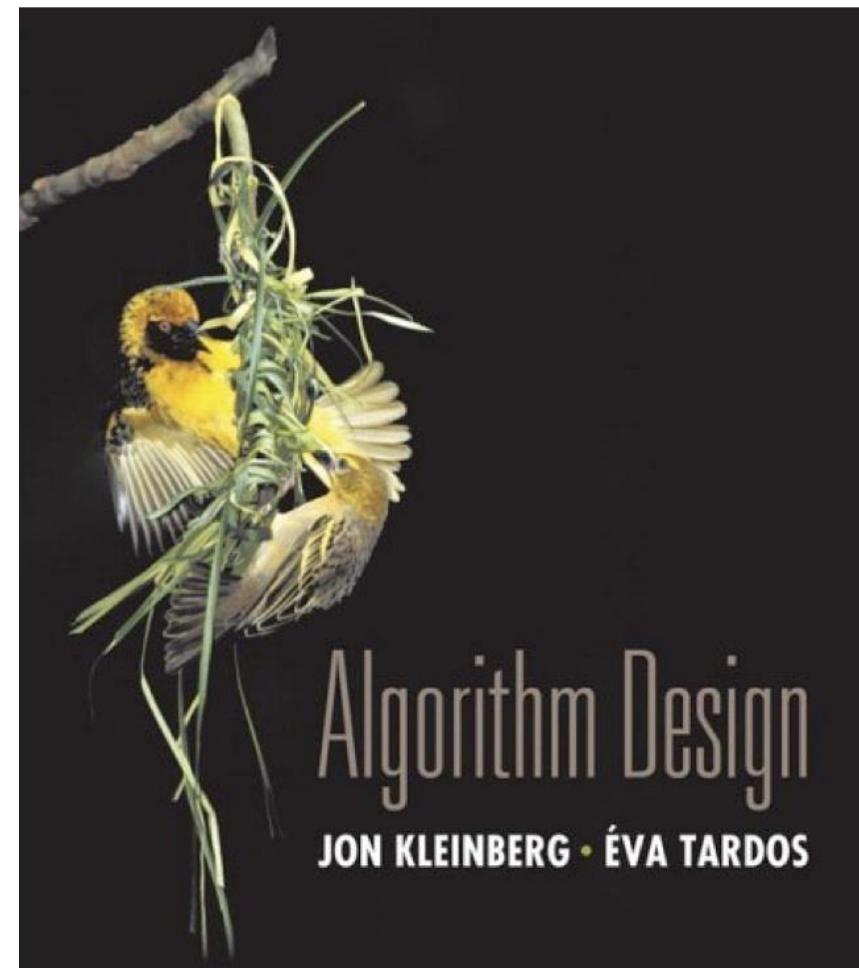
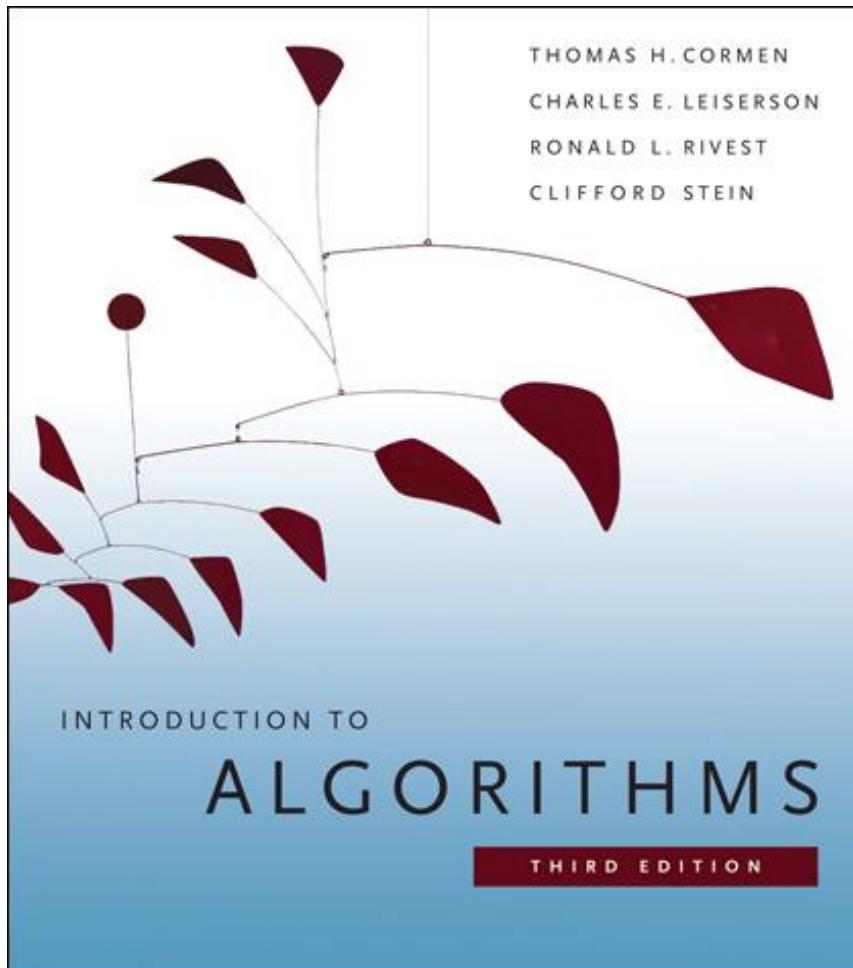
# 计算机基础书籍推荐

## • 算法基础(1)



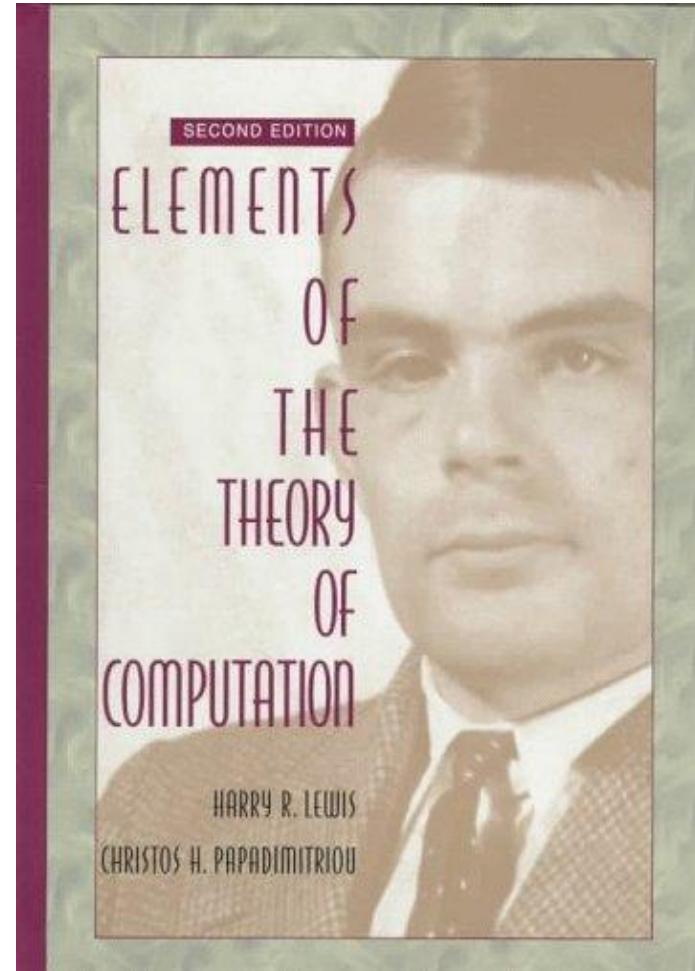
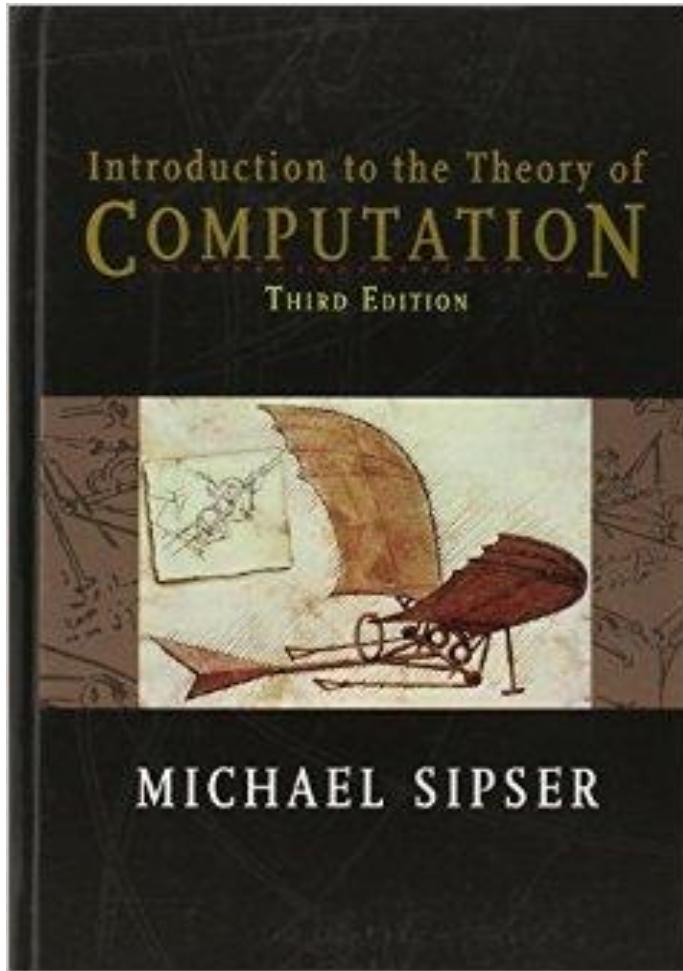
# 计算机基础书籍推荐

## • 算法基础(2)



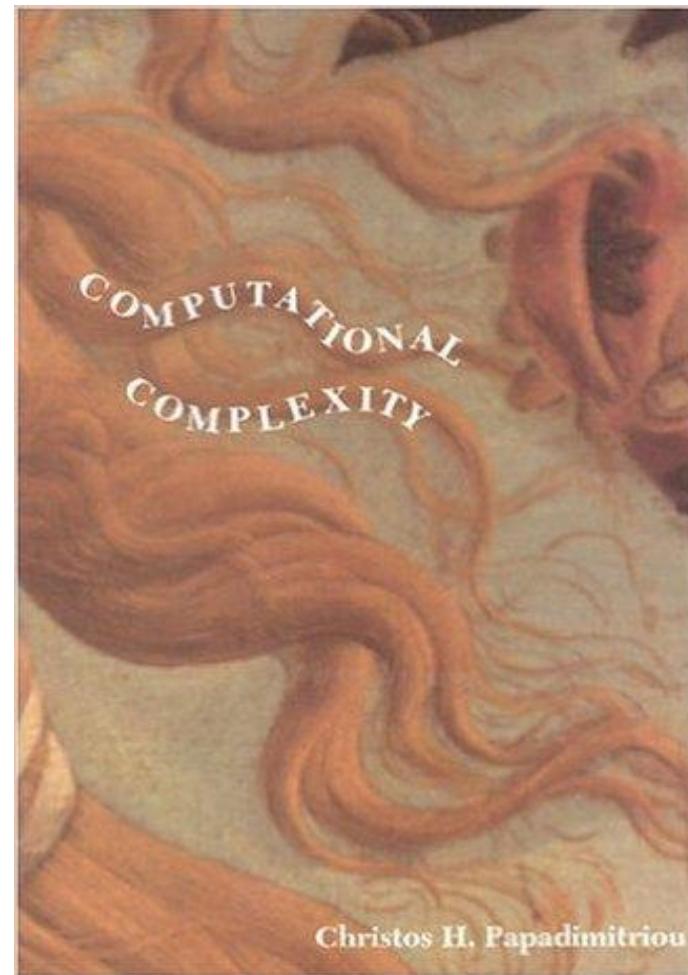
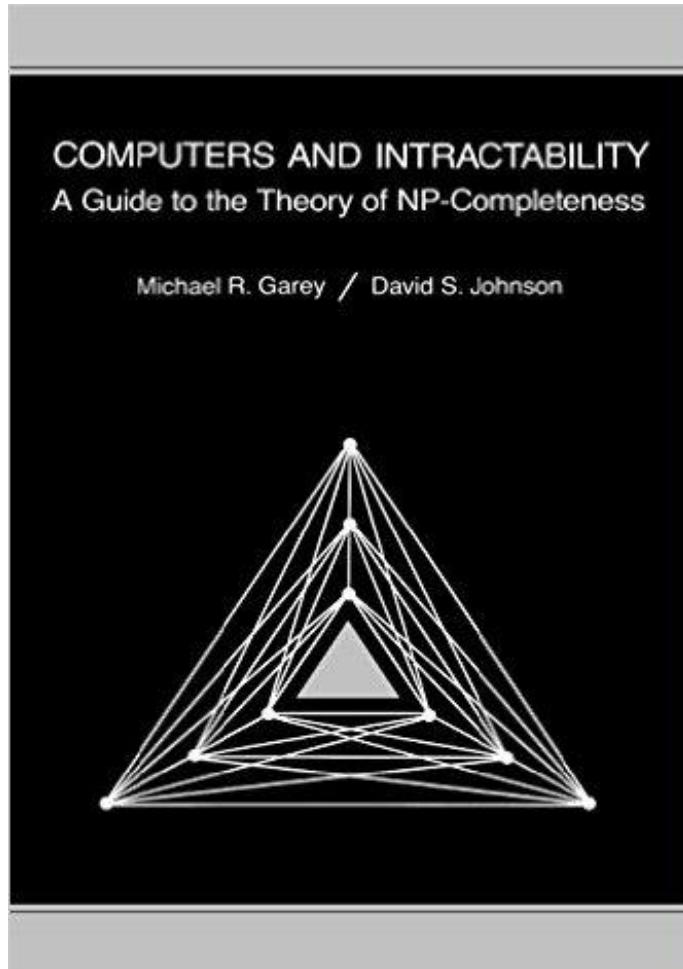
# 计算机基础书籍推荐

- 计算理论



# 计算机基础书籍推荐

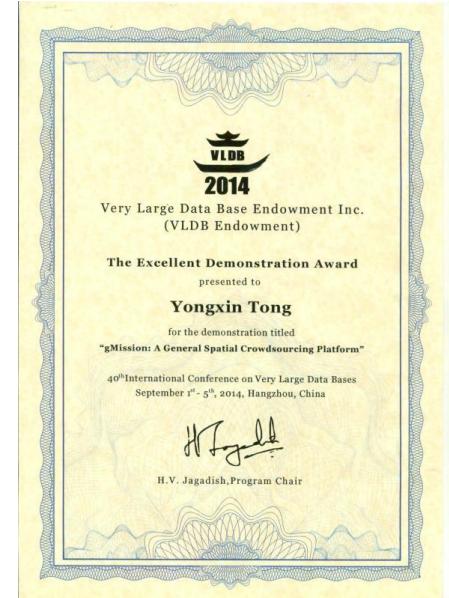
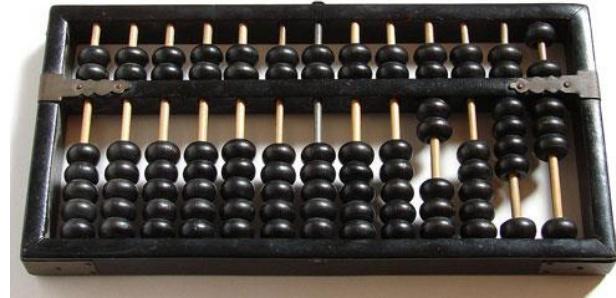
- 计算复杂性



# 研究组简介

## • Abacus

- Algorithms of Big data And CrowdsoUrcing Systems(大数据算法与众包系统研究组)
- 成员: 许可教授、童咏昕副教授、博硕20余位
- 成果: VLDB2014最佳系统奖等多项国内外学术奖励



# 致谢

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**Salamat!**

Asante 谢谢 ju faleminderit dank u  
Tack Tack mulțumesc  
kiitos Gracias  
Merci Dankie Obriqado Aliquam  
ありがとう köszönöm grazie Aliquam  
děkuji Go raibh maith agat gam  
dank u