

# Curriculum Vitae

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陳弘軒 **Hung-Hsuan Chen, Ph.D.**

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**SUMMARY** I am interested in data related research topics, such as **information extraction**, **information retrieval**, **data mining**, **natural language processing**, and **graph analysis**. I am also interested in applying research results to various application domains, such as **recommender systems**, **digital libraries**, and **social network**. I have co-authored **dozens of refereed research papers** that have received **hundreds of citations**. I consistently collaborate with industrial corporations, such as Alcatel Lucent, Dow Chemical, and Google to bring research results into practice. I have developed several publicly available Internet services. Recent projects include **CSSeer** (<http://csseer.ist.psu.edu/>), an expert recommender system for computer scientists that mines the CiteSeerX digital library, and **CollabSeer** (<http://collabseer.ist.psu.edu/>), a collaborator recommender system for computer scientists based on users' research interests and their previous coauthoring behaviors. I have made contributions to Open Source Software Projects, such as NetworkX and SeerSuite (the basis of the CiteSeerX digital library). I am familiar with state-of-the-art **software developing** techniques, such as **unit testing**, **test driven development**, **MVC (model-view-controller) model**, and distributed source code version management tools (e.g., **Git**). I am also highly experienced with **MapReduce** distributed programming model for big data processing.

**EDUCATION** **Ph.D.** Computer Science and Engineering, The Pennsylvania State University, University Park 2008 - 2013  
**M.S.** Computer Science, National Tsing Hua University 2004 - 2006  
**B.S.** Computer Science, National Tsing Hua University 2000 - 2004

**RECENT HONORS** **Best AI application**, Innovative Applications of Artificial Intelligence Conference (IAAI) 2014  
**The highest F1-score and the highest precision**, the Competition of Plagiarism Detection (Source Retrieval), the Evaluation Lab on Uncovering Plagiarism, Authorship, and Social Software Misuse (PAN) 2014  
**Best Paper Award**, College of Engineering Research Symposium, The Pennsylvania State University 2013  
**The highest F1-score**, the Competition of Plagiarism Detection (Source Retrieval), the Evaluation Lab on Uncovering Plagiarism, Authorship, and Social Software Misuse (PAN) 2013  
**Invited to Amazon PhD Research Symposium**, selected out of over 250 PhD students to present research works at Amazon's headquarters. **The acceptance rate is single digit percentage** 2013

<b>Travel Award</b> , Special Interest Group on Management of Data (SIGMOD)	2013
<b>Travel Award</b> , International Conference on Healthcare Informatics (ICHI)	2013
<b>Travel Award</b> , International Conference on Social Computing, Behavioral-Cultural Modeling and Prediction (SBP)	2012

## RECENT RESEARCHES

The the papers to appear, revised papers, submitted papers, and the papers in preparation.

Hung-Hsuan Chen, C. Lee Giles. ASCOS++: an Asymmetric Similarity Measure for Weighted Networks. *ACM Transactions on Knowledge Discovery from Data* (revised)

Hung-Hsuan Chen, C. Lee Giles. ExpertSeer: a Keyphrase Based Expert Recommender for Digital Libraries. *ACM Transactions on Management Information Systems* (under review)

Madian Khabsa, Hung-Hsuan Chen, C. Lee Giles. A Large Scale Analysis of a Digital Library's Access Logs *Joint Conference on Digital Libraries*, 2015 (submitted)

Hung-Hsuan Chen. Quantifying Citation Bias. (in preparation)

Hung-Hsuan Chen, C. Lee Giles. Large Scale Analysis of SCIdgen Papers in CiteSeerX. (in preparation)

Hung-Hsuan Chen. Sequential Collaborative Filtering. (in preparation)

## REFEREED PUBLICATIONS

The full text of these papers can be downloaded at: <http://dr-hhchen.appspot.com/>

\* In Computer Science, conference papers are typically formal publications<sup>1</sup>, and good conferences are usually more competitive than journals<sup>2</sup>. A good rule of thumb is that **the best conferences are sponsored by ACM**<sup>3</sup>.

### 2015

Jian Wu, Kyle Williams, Hung-Hsuan Chen, Madian Khabsa, Douglas Jordan, C. Lee Giles. CiteSeerX: AI in a Digital Library Search Engine. *AI Magazine*, 2015 (to appear).

### 2014

Hung-Hsuan Chen, Madian Khabsa, C. Lee Giles. The Feasibility of Investing of Manual Correction of Metadata for a Large-Scale Digital Library. *IEEE/ACM Joint Conference on Digital Libraries (JCDL)*, 2014. (**Acceptance rate:** 32%)

Zhaohui Wu, Jian Wu, Madian Khabsa, Kyle Williams, Hung-Hsuan Chen, Wenyi Huang, Suppawong Tuarob, Sagnik Ray Choudhury, Alexander Ororbia, Prasennjit Mitra, C. Lee Giles. Towards Building a Scholarly Big Data Platform: Challenges, Lessons and Opportunities. *IEEE/ACM Joint Conference on Digital Libraries (JCDL)*, 2014. (**Acceptance rate:** 29%)

Kyle Williams, Hung-Hsuan Chen, C. Lee Giles. Classifying and Ranking Search Engine Results as Potential Sources of Plagiarism. *ACM Symposium on Document Engineering (DocEng)*, 2014. (**Acceptance rate:** 37%)

<sup>1</sup>Steve Lawrence. Online or invisible. *Nature* 2001/05

<sup>2</sup>Bertrand Meyer, Christine Choppy, Jørgen Staunstrup, Jan van Leeuwen. Research Evaluation for Computer Science. *Communications of the ACM* 2009/04

<sup>3</sup>Michael Ernst. Choosing a venue: conference or journal? <http://homes.cs.washington.edu/~mernst/advice/conferences-vs-journals.html>

Kyle Williams, Hung-Hsuan Chen, C. Lee Giles. Supervised Ranking for Plagiarism Source Retrieval. *International Conference and Labs of the Evaluation Forum (CLEF)*, 2014. (**Highest F1-score and highest precision in Source Retrieval task of Plagiarism Detection at PAN 2014**)

Jian Wu, Kyle Williams, Hung-Hsuan Chen, Madian Khabsa, Douglas Jordan, C. Lee Giles. CiteSeerX: AI in a Digital Library Search Engine. *Proceedings of the 26th Innovative Applications of Artificial Intelligence Conference (IAAI)*, 2014. (**Voted as one of the best AI applications**)

Cornelia Caragea, Jian Wu, Alina Ciobanu, Kyle Williams, Juan Fernandez-Ramirez, Hung-Hsuan Chen, Zhaohui Wu, C. Lee Giles. CiteSeerX: A Scholarly Big Dataset. *Advances in Information Retrieval - 36th European Conference on IR Research (ECIR)*, 2014. (**Acceptance rate: 23%**)

## 2013

Hung-Hsuan Chen, C. Lee Giles. ASCOS: an Asymmetric Network Structure COntext Similarity Measure. *ACM/IEEE International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, 2013. (**Acceptance rate: 13%**)

Hung-Hsuan Chen, David J. Miller, C. Lee Giles. The Predictive Value of Young and Old Links in a Social Network. *Proceedings of the ACM SIGMOD Workshop on Databases and Social Networks (DBSocial)*, 2013.

Kyle Williams, Hung-Hsuan Chen, Sagnik Ray Choudhury, C. Lee Giles. Unsupervised Ranking for Plagiarism Source Retrieval. *International Conference and Labs of the Evaluation Forum (CLEF)*, 2013. (**Highest F1-score in Source Retrieval task of Plagiarism Detection at PAN 2013**)

Hung-Hsuan Chen, Pucktada Treeratpituk, Prasenjit Mitra, C. Lee Giles. CSSeer: an Expert Recommendation System based on CiteSeerX. *Proceedings of the 13th Annual ACM/IEEE Joint Conference on Digital Libraries (JCDL)*, 2013 (poster). (**Acceptance rate: 31%**)

Hung-Hsuan Chen, Liang Gou, Xiaolong (Luke) Zhang, C. Lee Giles. Towards the Discovery of Diseases Related by Genes Using Vertex Similarity Measures. *International Workshop on Data Mining for Healthcare (DMH)*, 2013.

## 2012

Hung-Hsuan Chen, Yan-Bin Ciou, Shou-De Lin. Information Propagation Game: a Tool to Acquire Human Playing Data for Multi-Player Influence Maximization on Social Networks. *ACM International Conference on Knowledge Discovery and Data Mining (KDD)*, 2012 (system demo).

Sumit Bhatia, Cornelia Caragea, Hung-Hsuan Chen, Jian Wu, Pucktada Treeratpituk, Zhaohui Wu, Madian Khabsa, Prasenjit Mitra, C. Lee Giles. Specialized Research Datasets in the CiteSeer<sup>X</sup> Digital Library. *D-Lib Magazine*, July/August 2012.

Hung-Hsuan Chen, Liang Gou, Xiaolong Zhang, C. Lee Giles. Predicting Recent Links in FOAF Networks. *International Conference on Social Computing, Behavioral-Cultural Modeling and Prediction (SBP)*, 2012.

Hung-Hsuan Chen, Liang Gou, Xiaolong Zhang, C. Lee Giles. Discovering Missing Links in Networks Using Vertex Similarity Measures. *Proceedings of the ACM Symposium on Applied Computing (SAC)*, 2012. (**Acceptance rate: 26%**)

## 2011

Hung-Hsuan Chen, Liang Gou, Xiaolong Zhang, C. Lee Giles. CollabSeer: A Search Engine for Collaboration Discovery. *Proceedings of the 11th Annual ACM/IEEE Joint Conference on Digital Libraries (JCDL)*, 2011. (**Acceptance rate:** 23%)

Hung-Hsuan Chen, Liang Gou, Xiaolong Zhang, C. Lee Giles. Capturing Missing Links in Social Networks Using Vertex Similarity. *Proceedings of the 6th ACM International Conference on Knowledge Capture (K-CAP)*, 2011. (**Acceptance rate:** 24%)

~2010

Liang Gou, Xiaolong Zhang, Hung-Hsuan Chen, Jung Hyun Kim, C. Lee Giles. Social network document ranking. *Proceedings of the 10th Annual ACM/IEEE Joint Conference on Digital Libraries (JCDL)*, 2010. (**Acceptance rate:** 29%)

Liang Gou, Hung-Hsuan Chen, Jung Hyun Kim, Xiaolong Zhang, C. Lee Giles. SNDocRank: Document Ranking Based on Social Networks. *Proceedings of the 19th ACM International World Wide Web Conference (WWW)*, 2010 (poster). (**Acceptance rate:** 30%)

Liang Gou, Hung-Hsuan Chen, Jung Hyun Kim, Xiaolong Zhang, C. Lee Giles. SNDocRank: a Social Network-Based Video Search Ranking Framework. *ACM International Conference on Multimedia Information Retrieval (MIR)*, 2010. (**Acceptance rate:** 18%)

Liang Gou, Jung Hyun Kim, Hung-Hsuan Chen, Jason Collins, Marc Goodman, Xiaolong Zhang, C. Lee Giles. MobiSNA: a Mobile Video Social Network Application. *ACM Workshop on Data Engineering for Wireless and Mobile Access (MobiDE)*, 2009.

Hung-Hsuan Chen, Kuan-Ta Chen, Cheng-Chun Tu. A User-Centric Framework for Computing Applications' Network Robustness. *ACM Special Interest Group on Data Communications (SIGCOMM)*, 2008 (poster).

Chen-Lung Chan, Shih-Yu Huang, Hung-Hsuan Chen, Wei-Hao Tung, Jia-Shung Wang. An Application-Level Multicast Framework for Large Scale VOD Services. *IEEE International Conference on Parallel and Distributed Systems (ICPADS)*, 2005.

## RESEARCH PROJECTS

### CSSeer

2012 - 2014

Chief developer of CSSeer, an expert recommender system for computer scientists based on the CiteSeerX digital library.

- CSSeer automatically extracts topic terms from +1,500,000 research papers.
- CSSeer recommends experts and compiles related terms (mainly in Computer Science) based on a user submitted query term.
- The framework is shipped to Dow for internal expert discovery.
- URL: <http://csseer.ist.psu.edu/>
- Source: <https://github.com/hhchen1105/expertseer/>

### CollabSeer

2009 - 2012

Chief developer of CollabSeer, a potential collaborator recommender system for computer scientists based on the CiteSeerX digital library.

- CollabSeer includes +1,300,000 computer science related documents and +300,000 unique (disambiguated) authors.
- CollabSeer recommends potential collaborators based on the querist's research interests and previous coauthoring behaviors.
- URL: <http://collabseer.ist.psu.edu/>

**MobiSNA** 2008 - 2011  
Co-developed MobiSNA, a multimedia digital library for mobile phone and portable device users.

- MobiSNA improves search experience by a new document ranking mechanism that integrates textual relevance, user's interests, and her/his friends' interests.
- URL: <http://mobisna.ist.psu.edu/>

**Comic Layout Generator** 05/2008 - 07/2008

- Developed the first prototype of the layout generator for a comic generation system, an automatic platform to summarize game players' actions and interactions in a video game.

**The Application's Network Robustness Evaluator** 11/2007 - 05/2008

- The robustness of network applications was quantified in terms of their ability to handle network errors (e.g., network delay and loss) based on users' departure decisions.

**DTV/MHP integrated program, EPG sub-program** 2004 - 2006

- Co-developed a personalized TV program recommender system based users' previous watching behaviors and various other features.
- Co-developed a 3-dimensional browsing interface for an electronic program guide, which enables more information to be displayed on a limited TV screen.

**Microsoft Windows CE .NET curriculum subject** 07/2003 - 12/2003

- Improved the default memory management feature of Windows CE such that the required memory space of each process could be dynamically allocated and the number of simultaneous processes could be larger than the original constraint (32).

**HTTP Load Balancer** 03/2003 - 05/2003

- Co-developed a load balancer to actively detect or predict loads in each back-end web server instead of passively balancing loads by using Round Robin.
- System throughput increases linearly with the number of back-end web nodes.

RESEARCH AND  
WORKING  
EXPERIENCE

**Researcher, Computational Intelligence Technology Center, Industrial Technology Research Institute** 2014 - present

- Recommender systems
- Smart healthcare

**RA, Information Sciences and Technology, The Penn State University** 2008 - 2014

- Developed generic techniques for expert recommendation for scientific documents.
- Developed several algorithms to find the relevance level between different objects.
- Proposed several methodologies to improve the ranking algorithms for search engines.
- Developed the keyphrase extracting component of the open source search engine CiteSeerX (+600K unique users/month, +4M ingested documents in 2014), which automatically crawls, ingests, and indexes scientific documents from the Internet.
- Detected computer-generated fake papers in the CiteSeerX digital library.
- Analyzed user behaviors (e.g., downloading, searching, page transitions) of the CiteSeerX users from logs (+3 billion log entries).

**RA, Computer Science and Information Engineering, National Taiwan University** 08/2011 - 01/2012

- Investigated the information propagation problem in which multiple parties compete with each other to maximize their influence or minimize the competitors' influence in a social network.

**Software Engineer Intern, Google** 05/2010 - 08/2010

- Developed a potential customer discovery platform in C++ for Google AdSense based on parametric-based machine learning modeling. The system is on top of the MapReduce framework to handle user clicking logs and user profiles.

**RA, Institute of Information Science, Academia Sinica** 11/2007 - 07/2008

- Quantified the robustness of network applications in terms of their ability to handle network errors.

**RA, Computer Science, National Tsing Hua University** 09/2004 - 07/2006

- Proposed a distributed algorithm to efficiently discover frequent items in distributed data streams. This is particularly useful in mining typical patterns for large amounts of continuous data, such as the logs of websites and telecommunication systems.

**TA, Operating Systems, National Tsing Hua University** 09/2005 - 01/2006

- Designed and graded three projects for 100+ students using the NachOS operating system.

INVITED TALKS

Talks in addition to those involved in the conference publications above.

**The theory and practice of scholarly big data.** 清大資工系 The Department of Computer Science, National Tsing Hua University 2015

**Gaining values from big data – using digital libraries and complex networks as examples.** The Department of Computer Science, The Rochester Institute of Technology 2014

**Mining experts and each author's expertise from a digital library.** Amazon PhD Symposium, Amazon 2013

**ExpertSeer: a keyphrase based expert recommender for digital libraries.** College of Engineering Research Symposium, The Pennsylvania State University 2013

**ASCOS: an asymmetric similarity measure based on network topology.** Network Science Seminar, The Pennsylvania State University 2013

**The challenges of aggregated search: using expert search as an example.** SIG Comp Seminar, The Pennsylvania State University 2013

**ExpertSeer: a keyphrase based recommendation framework for a digital library expert discovery.** Graduate Exhibition, The Pennsylvania State University 2013

**Ranking authors in a search engine with and without social network influence.** Guest Speaker of IST 441: Information Retrieval and Search Engines, The Pennsylvania State University 2013

	<b>CollabSeer: a search engine for collaboration discovery.</b> Graduate Exhibition, The Pennsylvania State University 2012
	<b>Integrating social influence to search engines.</b> Guest Speaker of IST 441: Information Retrieval and Search Engines, The Pennsylvania State University 2011
PROFESSIONAL SERVICE	<p><b>Reviewer</b>, IEEE Transactions on Knowledge and Data Engineering (TKDE) 07/2014</p> <p><b>Reviewer</b>, Physica A: Statistical Mechanics and its Applications 05/2014</p> <p><b>Reviewer</b>, Journal of Information Science and Engineering (JISE) 01/2014, 07/2013</p> <p><b>Reviewer</b>, ACM International Conference on World Wide Web (WWW) 2014, 2015</p> <p><b>Reviewer</b>, International Conference on Social Computing, Behavioral-Cultural Modeling and Prediction (SBP) 2013</p> <p><b>Sub-reviewer</b>, ACM Transactions on Information Systems (TOIS) 05/2014</p> <p><b>Sub-reviewer</b>, Digital Libraries (DL) 2014</p> <p><b>Sub-reviewer</b>, IEEE Intelligent Systems 07/2013</p> <p><b>Sub-reviewer</b>, International Conference on Theory and Practice of Digital Libraries (TPDL) 2013</p> <p><b>Sub-reviewer</b>, ACM/IEEE Joint Conference on Digital Libraries (JCDL) 2013, 2012, 2011, 2010</p> <p><b>Sub-reviewer</b>, ACM International Conference on Research and Development in Information Retrieval (SIGIR) 2014, 2013, 2012, 2011</p> <p><b>Sub-reviewer</b>, ACM International Conference on World Wide Web (WWW) 2013, 2012, 2011</p> <p><b>Sub-reviewer</b>, ACM International Conference on Information and Knowledge Management (CIKM) 2012</p> <p><b>Sub-reviewer</b>, IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM) 2012</p> <p><b>Sub-reviewer</b>, International Conference on Machine Learning (ICML) 2012</p> <p><b>Sub-reviewer</b>, ACM International Conference on Knowledge Discovery and Data Mining (KDD) 2011</p>
TECHNICAL SKILLS	<p>PROGRAMMING LANGUAGES: Python (expert), C/C++ (proficient), Java (proficient), R (proficient), MATLAB (fair), PHP (fair), C# (prior experience)</p> <p>TOOLS/PACKAGES: Apache Solr/Lucene, MySQL, Git, Hadoop, L<sup>A</sup>T<sub>E</sub>X</p> <p>OPERATING SYSTEMS: UNIX/Linux, MS-Windows</p>
MISC.	<p>My other professional pages:</p> <p><b>Google Scholar</b> <a href="http://scholar.google.com/citations?user=T29tmA8AAAAJ">http://scholar.google.com/citations?user=T29tmA8AAAAJ</a></p> <p><b>DBLP</b> <a href="http://www.informatik.uni-trier.de/~ley/pers/hd/c/Chen:Hung=Hsuan.html">http://www.informatik.uni-trier.de/~ley/pers/hd/c/Chen:Hung=Hsuan.html</a></p> <p><b>ACM</b> <a href="http://dl.acm.org/author_page.cfm?id=81440600313">http://dl.acm.org/author_page.cfm?id=81440600313</a></p> <p><b>LinkedIn</b> <a href="http://www.linkedin.com/in/hhchen">http://www.linkedin.com/in/hhchen</a></p> <p><b>GitHub</b> <a href="https://github.com/hhchen1105/">https://github.com/hhchen1105/</a></p>