

WESLEY W. CHU

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Biography

Dr. Wesley W. Chu is a Distinguished Professor (emeritus) at the University of California, Los Angeles. His academic background includes B.S. and M.S. degrees (EE) from the University of Michigan, and a Ph.D. (EE) from Stanford University. Early in his career, Dr. Chu worked on the design of large-scale computers at IBM; this was followed by a three-year stint at Bell Laboratories and a focus on computer communications and distributed databases. He joined the faculty of UCLA in 1969 and later served as department chair for three years. Dr. Chu is the author or coauthor of more than 150 articles, an editor of three textbooks on information technology, and the editor of a reference book on data mining entitled *Data Mining and Knowledge Discovery for Big Data*, Springer, 2014.

Early in his career, Dr. Chu's research focus was on computer communication and networks, distributed databases, memory management, real-time distributed processing systems, and statistical multiplexing - the latter contributing to the development of ATM networks. His pioneering work in file allocation and directory design for distributed databases aided the design and development of domain name servers for the web and current cloud computing systems. Dr. Chu was named an IEEE Fellow for his contributions in these areas.

Over the past two decades, Dr. Chu's research interests evolved to include intelligent (knowledge-based) information systems and knowledge acquisition for large information systems. Using his methodology for relaxing query constraints, he led the development of *CoBase*, a cooperative database system for structured data, and *KMed*, a knowledge-based multimedia medical image system.

Under the *KMed* project, a Medical Digital Library was developed that provides approximate content-matching and navigation; the library will serve as a cornerstone for future paperless hospitals. In recent years, Dr. Chu also worked on inference techniques for data security and privacy protection (ISP) and social network-based recommender system (SNRS).

Together with his students, Dr. Chu has received numerous best paper awards at conferences and workshops, and also a certificate of merit for work on the Medical Digital Library system. He is the recipient of the IEEE Computer Society's Technical Achievement Award for contributions to intelligent information systems.

Service to the technology community has been a significant factor in Dr. Chu's career: ACM SIGCOMM chairman for three years; associate editor for IEEE Transactions on Computers for Computer Networking and Distributed Processing Systems for four years; chair, co-chair or technical chair of numerous workshops and conferences on systems management, data communications, very-large databases, information knowledge sharing, and entity relationships. For his services to IEEE, he received both a meritorious award and a certificate of appreciation.

Education

- University of Michigan Electrical Engineering B.S. 1960
- University of Michigan Electrical Engineering M.S. 1961
- Stanford University Electrical Engineering Ph.D. 1966

Academic Appointment

Computer Science Department University of California, Los Angeles

1969 to present:

- Professor (since 1975)
- Department Chair (1988-91)
- Distinguished Professor (since 1998)
- Emeritus Distinguished Professor (since 2009)

Industrial Experience

1995-2005 Xerox Corporation El Segundo, CA

Consultant - Fault tolerant computing, design and develop word processing systems.

1985-1988 Unisys SDC Corp, Huntsville, Alabama

Consultant - Design and develop of a real time distributed data base system for missile defense applications

1983--1986 Titan Systems Inc., Inglewood, CA

Consultant - Develop, evaluate, and validate for the SENTRY Distributed Data Base System

1982-1984 Western Union Corporation Upper Saddle River, NJ

Executive Consultant to VP Engineering and Member of the Technical Review Board.

Duties include:

- Evaluate and plan for the Western Union Packet Switched Network, Easylink, and other value-added services. Develop transition plans for network modernization, integration with existing networks and for future network growth.
- Critique on going and proposed enhancement plans and compare with other viable alternatives for effectiveness.

1966-1969 Bell Telephone Laboratories Holmdel, NJ

Member of Technical Staff. Research on computer communications and file allocations in

distributed data base systems.

1964-1966 IBM San Jose, California

Engineer. Simulation of magnetic memory systems. Logical design of computers.

1961-1962 GE (now Honeywell) Computer Department Phoenix, Arizona

Electronic engineer. Design of electronic switching circuits for computers.

Selected Publications

Social Network Based Recommender System

- Jianming He and **Wesley W. Chu**. "A Social Network Based Recommender System". *Annals of Information Systems: Special Issue on Data Mining for Social Network Data (AIS-DMSND)*, 2010.

Security and Privacy

- Y. Chen and **W. W. Chu** "**Protection of Database Security via Collaborative Inference Detection**" *In IEEE Transactions on Knowledge and Data Engineering (TKDE), Special Issue on Intelligence and Security Informatics*, Vol 20, No 8, August 2008, PP.1013-1027
- J. He, **W. W. Chu** and Z. Liu "Inferring Privacy Information from Social Networks", *In Proc. of IEEE Intelligence and Security Informatics Conference (ISI 2006)*, San Diego, California, USA, May 2006.
- Y. Chen and **W. W. Chu** "Database Security Protection via Inference Detection", *In Proc. of IEEE Intelligence and Security Informatics Conference (ISI 2006)*, San Diego, California, USA, May 2006.

Intelligent Information Systems

- Sanghyun Park, S-W Kim and **Wesley W. Chu**. "SBASS: Segment Based Approach for Subsequence Search in Sequence Databases" *In International Journal of Computer Science & Engineering, 2007*
- Shaorong Liu and **Wesley W. Chu**. "**CoXML: A Cooperative XML Query Answering System**" *In the 8th International Conference on Web-Age Information Management, 2007*
- **Wesley W. Chu** and Shaorong Liu. "CoXML: Cooperative XML Query Answering" *In the Encyclopedia of Computer Science and Engineering, Edit by B. Wah, John Wiley & Sons, Inc, 2007*
- *Shaorong Liu, Wesley W. Chu, and Ruzan Shahinian. "Vague Content and Structure (VCAS) Retrieval for Document-centric XML Collections." In WebDB (in conjunction with SIGMOD), 2005.*
- S. Liu, **W. W. Chu** and R. S. Shahinian "**Vague Content and Structure (VCAS) Retrieval for Document-Centric XML Collections**", *In Proc. of the Eighth International Workshop on the Web and Databases (WebDB)*, Baltimore, Maryland, USA, June 2005.
- Zou, Q., S. Liu, and **W. W. Chu** "Using a Compact Tree to Index and Query XML Data", *Proceedings of the Conference on Information and Knowledge Management (CIKM)*, 2004.

- Liu, S., Q. Zou and **W. W. Chu** "Configurable Indexing and Ranking for XML Information Retrieval", *ACM Proceeding of Special Interest Group on Information Retrieval (SIGIR)*, 2004
- Lee, D., W. Mao, H. Chiu, **W. W. Chu** "Designing Triggers with Trigger-By-Example", *Knowledge and Information Systems*, Springer, 2004

Data Mining

- Chen Liu, **Wesley W. Chu**, Fred Sabb, D. Stott Parker, and Joseph Korpela. "Path Knowledge Discovery: Association Mining Based on Multi-Category Lexicons." IEEE International Conference on Big Data, 2014
- Qinghua Zou, **Wesley W. Chu**, Yu Chen, and Xinchun Lu. "Mining association rules from tabular data guided by maximal frequent itemset. In *W.W. Chu and T.Y. Lin, editors, Foundations and Advances in Data Mining. Springer, 2005.*
- Zou, Q. and **W. W. Chu** "Mining Frequent Patterns via Pattern Decomposition", *Encyclopedia of Data Warehousing and Mining*, Springer, 2005.
- Zou, Q., **W. W. Chu**, D. Johnson, H. Chiu, "Pattern Decomposition Algorithm for Data Mining of Frequent Patterns", *International Journal on Knowledge and Information Systems (KAIS)*, pp. 1-14, 2002.
- Zou, Q., **W. W. Chu**, and B. Lu. "SmartMiner: A Depth First Algorithm Guided by Tail Information for Mining Maximal Frequent Itemsets", *Proceedings of the IEEE International Conference on Data Mining*, Japan, Dec 2002

Knowledge-Based Multi-Media Medical Information Systems

- Yu Chen, Lars Henning Pedersen, **Wesley W. Chu** and Jorn Olsen. "Drug Exposure Side Effects from Mining Pregnancy Data" *In SIGKDD Explorations (Volume 9, Issue 1), June 2007, Special Issue on Data Mining for Health Informatics*, Guest Editors: Raymond Ng and Jian Pei.
- Zhenyu Liu and **Wesley W. Chu** "Knowledge-Based Query Expansion to Support Scenario-Specific Retrieval of Medical Free Text" *Journal of Information Retrieval, special issue on Contextual Information Retrieval, 2007*
- **W. W. Chu**, Z. Liu., W. Mao, and Q. Zou. "A Knowledge-Based Approach for Retrieving Scenario-specific Medical Text Documents" *In Control Engineering Practice*. 13 (9), pp. 1105-1121, 2005.
- Liu, Z. and **W. W. Chu**, "Knowledge-based Query Expansion to Support Scenario-Specific Retrieval of Medical Free Text", *In Proc. of the 20th ACM Symposium on Applied Computing (SAC 2005)*, Special Track on Information Access and Retrieval, Santa Fe, NM, March 2005.
- Mao, W. and **W. W. Chu**, "Free text medical document retrieval via phrase-based vector space model", *Proceedings of AMIA 2002*, San Antonio, Texas, November 2002 (2nd place, best student paper award).
- Zou, Q., **W. W. Chu** and H. Kangaroo, "**IndexFinder**: A Knowledge-based Method for Indexing Clinical Texts", at *Proceedings of AMIA 2003* (3rd place, best student paper award)
- Park, S., **W. W. Chu**, J. Yoon and J. Won, "Similarity Search of Time-Warped Subsequences Via a Suffix Tree", in *Information Systems*, 2003.
- Park, S and **W. W. Chu**, "Similarity-Based Subsequence Search in Image Sequence Databases", *International Journal of Images and Graphics*, Vol. 3, No. 1, pp. 31-53, 2003, February, 2003.

Books, Chapters in Books, Editorships

- **Wesley W. Chu**, Editor, Data Mining and Knowledge Discovery for Big Data, *Methodologies, Challenge and Opportunities*, Springer, 2014
- Jianming He and **Wesley W. Chu**. "Design Considerations for a Social Network Based Recommender System". *Community-Built Databases: Research and Development*, 2011
- Jianming He and **Wesley W. Chu**. "Protecting Private Information in Online Social Networks" Chapter 14 in *Intelligence and Security Informatics* (edited by H. Chen and C.C. Yang), SCI 135, pp. 249-273, 2008.
- Yu Chen and **Wesley W. Chu**. "Protection of Database Security via Collaborative Inference Detection" Chapter 15 in *Intelligence and Security Informatics* (edited by H. Chen and C.C. Yang), SCI 135, pp. 275-303, 2008.
- **Wesley W. Chu**, Victor Liu, Wenlei Mao and Qinghua Zou "KMeX: A Knowledge- based Digital Library or retrieving Scenario-specific Medical Text Documents" Chapter 14 in *Biomedical Information Technology*, (edited by D. Feng) Elsevier Academic Press Series in Biomedical Engineering, 2008.
- **Wesley W. Chu** and S. Liu. "Cooperative XML (CoXML) Query Answering". B. Wah, ed. *Encyclopedia of Electrical and Electronic Engineering*, John Wiley & Son, Inc., Dec. 2007.
- Zou, Q., Y. Chen, **Wesley W. Chu**, X. Lu. "Mining Association **Rules** from Tabular Data Guided by Maximal Frequent Itemsets", in *Foundations and Advances in Data Mining*. Chu, W.W. and T.Y. Lin, eds. Springer, 2005. .
- **Chu, W. W.** and T.Y. Lin, Editors. *Foundations and Advances in Data Mining.*" Springer, 2005.

Patents

- "System and Methods for evaluating Inferences for Unknown Attributes in a Social Network" U.S. Patent Number 8,160,993 April 17,2012, Lead inventor, Wesley W. Chu
- "System and Method for Retrieving Scenario Specific Documents" U.S. Patent Number 7, 548,910, June 2009, Lead inventor, Wesley W. Chu
- "Database Event Detection and notification System Using Type Abstraction Hierarchy (TAH)" U.S. Patent Number 6,247,146, July 2002
- "Database System with query relaxation using Type Abstraction Hierarchy (TAH) as Query Condition Relaxation Structure" U.S. Patent Number 6,427,146, Sept 1999
- "Statistical Multiplexing Systems for Computer Communications," U.S. patent number 4,082,922, April 1978; US Patent Number 4,093,823, June 1978.
- "Multi-access Memory Module for Data Processing System," (co-invented with P. Korff), U.S. patent number 4,109,719, August 1978.
- "Multiplexed MOS Multi-Accessed Memory System" (co-invented with D. Hibbits), U.S patent number 4,415,991, November 1983.

Honors, Awards and Special Recognitions

- IEEE Fellow for contribution of *multiplexing technique and file allocation in computers* (1978).
- IEEE Meritorious Service Award, associate editor for *Computer Network and Distributed Processing* (1983).

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