

Anxiao (Andrew) Jiang

Home Address

1160 Cordova St., Apt. 2
Pasadena, CA 91106

Cell phone: (626) 236-2186

University Address

California Institute of Technology
MC 136-93, Pasadena, CA 91125

Phone: (626) 395-8504

Fax: (626) 395-8952

Email: jax@paradise.caltech.edu

<http://www.paradise.caltech.edu/jax>

Research Interests

Algorithms, file storage in networks, wireless ad hoc communication and sensor networks, distributed systems.

Education

Sep 2000 – June 2004 Ph.D. in Electrical Engineering (Parallel and Distributed Systems Lab)
California Institute of Technology, Pasadena, CA
Overall GPA: 4.2/4.0

Sep 1999 – June 2000 M.S. in Electrical Engineering (Parallel and Distributed Systems Lab)
California Institute of Technology, Pasadena, CA
Overall GPA: 4.1/4.0

Sep 1994 – July 1999 B.S. in Electronic Engineering, **Tsinghua University**, Beijing, China
Major in Electronic and Information Systems, 5-year program
Overall GPA 91/100, ranked 1st in class.

Dissertation

Title: Optimized Network Data Storage and Topology Control

Advisor: Prof. Jehoshua Bruck

This thesis addresses two key challenges for network data-storage systems: optimizing data placement for highly efficient and robust data access, and constructing network topologies that facilitate data transmission scalable to both network sizes and network dynamics. It focuses on two new topics — data placement using erasure-correcting codes, and topology control for nodes in normed spaces. The first topic generalizes traditional file-assignment problems, and has the distinct feature of interleavingly placing data in networks. The second topic emphasizes the construction of network topologies that achieve excellent global performance in comprehensive measurements, through purely local decisions on connectivity. The results of the thesis deepen the current understanding on these important and intriguing topics, and follow a mathematically rigorous approach.

Honors and Awards

1999-2003 Caltech Engineering Division Fellowship
1999 Caltech Shannon Prize
1999 B.S. degree with Honors, Tsinghua University
1996 Honor of Distinguished Undergraduate Student of Tsinghua University
1996 Special Research Training Program for Outstanding Students
1995 Second Rank Award in University Physics Contest, Beijing, China
1994-1999 Undergraduate fellowships at Tsinghua University every year

Research Experience

- July 2004 – present Postdoc Fellow, **California Institute of Technology**, Pasadena, CA
 Research focuses on design and analysis of algorithms for information networks, currently with emphasis on wireless ad hoc communication and sensor networks. Topics include localization, routing and information query.
- Sep 1999 – June 2004 Research Assistant, **California Institute of Technology**, Pasadena, CA
 Advisor: Prof. Jehoshua Bruck
 Research on design and analysis of algorithms for distributed file storage in networks, with respective focuses on efficient data access and fault tolerance, memory cost, file recovery complexity, and multi-access of data.
 Research on file placement for en-route web caching.
 Research on topology control, localization and multicast in wireless ad hoc networks.
- July 1996 – June 1999 Undergraduate Research Assistant, **Tsinghua University**, Beijing, China
 Research on remote surveillance and network data communication.

Teaching Experience

- Departments of Computer Science and Electrical Engineering, **Caltech**
- Winter 2002 Teaching Assistant, Wireless Communications
 Fall 2001 Teaching Assistant, Networking
 Fall 2000 – Spring 2001 Teaching Assistant, Error Correcting Codes
 Winter 2000 Teaching Assistant, Information Theory
- Duties included lecturing, grading homework and exams, and holding office hours. Experience in teaching both undergraduate and graduate students.

Invited Talks

- Network Data Storage and Topology Control. Hitachi Global Storage Technologies Research Center, San Jose, CA, October, 2004.
- High-performance File Allocation. NEC Laboratories America, Princeton, NJ, May, 2004.
- Interleaving for Network Data Storage. Networking, Communications and DSP Seminar, University of California, Berkeley, November, 2003.
- Dispersed Information Storage for Performance and Reliability. Information Science and Technology Seminar, California Institute of Technology, February, 2002.

Patent

- Routing in Wireless Networks Based on Medial Axis and Other Geometric Features, with J. Gao and J. Bruck, US provisional patent filed, April, 2005.

Other Professional Activities

Gave talks at various academic conferences and workshops.

Peer-reviewed 37 papers for top academic journals and conferences, including ACM Transactions on Storage, Algorithmica, IEEE Transactions on Computers, IEEE Transactions on Information Theory, IEEE Transactions on Parallel and Distributed Systems, SIAM Journal on Discrete Mathematics, IEEE INFOCOM, IEEE GLOBECOM, IEEE ICDCS, International Conference on Dependable Systems and Networks, International Conference on Information Processing in Sensor Networks, etc.

Member of IEEE, IEEE Information Theory Society, IEEE Computer Society.

Publications

On network data storage and data interleaving

- A. Jiang and J. Bruck, Network File Storage with Graceful Performance Degradation, *ACM Transactions on Storage*, vol. 1, no. 2, pp. 171-189, May 2005.
- A. Jiang and J. Bruck, Multicluster Interleaving on Paths and Cycles, *IEEE Transactions on Information Theory*, vol. 51, no. 2, pp. 597-611, February 2005.
- A. Jiang and J. Bruck, Coding over Graphs, book chapter in *Information, Coding and Mathematics*, pp. 355-364, Kluwer Academic Publishers, 2002.
- A. Jiang, M. Cook and J. Bruck, Optimal Interleaving on Tori, submitted to *SIAM Journal on Discrete Mathematics*.
- A. Jiang and J. Bruck, Diversity Coloring for Distributed Data Storage in Networks, submitted to *IEEE Transactions on Information Theory*.
- A. Jiang, M. Cook and J. Bruck, Optimal t-Interleaving on Tori, *Proc. IEEE International Symposium on Information Theory (ISIT'04)*, pp. 22, June–July, 2004.
- A. Jiang and J. Bruck, Multi-Cluster Interleaving on Linear Arrays and Rings, *Proc. International Symposium on Communication Theory and Applications*, pp. 112-117, July 2003.
- A. Jiang and J. Bruck, Memory Allocation in Information Storage Networks, *Proc. IEEE International Symposium on Information Theory (ISIT'03)*, pp. 453, June–July, 2003.
- A. Jiang and J. Bruck, Optimal Content Placement for En-route Web Caching, *Proc. the 2nd IEEE International Symposium on Network Computing and Applications*, pp. 9-16, April 2003.
- A. Jiang and J. Bruck, Diversity Coloring for Information Storage in Networks, *Proc. IEEE International Symposium on Information Theory (ISIT'02)*, pp. 381, June–July, 2002.

On wireless ad hoc communication and sensor networks

- J. Bruck, J. Gao and A. Jiang, MAP: Medial Axis Based Geometric Routing in Sensor Networks, *Proc. the 11th ACM International Conference on Mobile Computing and Networking (MobiCom'05)*, August–September, 2005.
- J. Bruck, J. Gao and A. Jiang, Localization and Routing in Sensor Networks by Local Angle Information, *Proc. the 6th ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc'05)*, pp. 181-192, May 2005.
- A. Jiang and J. Bruck, Monotone Percolation and The Topology Control of Wireless Networks, *Proc. the 24th IEEE INFOCOM*, March 2005.

On data structures for membership query

- J. Bruck, J. Gao and A. Jiang, On The Space Optimality and Generalization of Bloom Filter, submitted to *the 25th IEEE INFOCOM*, April 2006.

On remote surveillance and network data communication

Z. Wang, A. Jiang and Z. Kang, A Remote-Surveillance System Using Digital Image Processing Technology, *Computers and Networks*, vol. 10, pp. 17-18, May 1999.

Link to Publications: <http://www.paradise.caltech.edu/jax>

References

Names will be provided upon request.