

Zimu Liu

AFFILIATION	500px Inc. 100-20 Duncan Street Toronto, Ontario, M5H 3G8, Canada	<i>Office:</i> +1 855-561-4584 <i>Email:</i> zimu@500px.com <i>Web:</i> 500px.com
INTERESTS	Design and implementation of reusable frameworks for interactive mobile and web applications, measurement studies on large-scale peer-to-peer applications and distributed systems.	
EDUCATION	University of Toronto , Toronto, Ontario, Canada The Edward S. Rogers Sr. Department of Electrical and Computer Engineering	
	◇ Doctor of Philosophy, 2015	
	▷ <i>Dissertation:</i> “Bellini: Optimizing Mobile Application Traffic Flows through the Cloud”	
	▷ <i>Advisor:</i> Professor Baochun Li, Department of Electrical and Computer Engineering	
	◇ Master of Applied Science, 2010	
	▷ <i>Thesis:</i> “Measurements on Large-Scale Peer-Assisted Live Streaming: A Survival Analysis Approach”	
	▷ <i>Advisor:</i> Professor Baochun Li, Department of Electrical and Computer Engineering	
	Nanjing University of Posts and Telecommunications , Nanjing, Jiangsu, China Department of Computer Science	
	◇ Bachelor of Engineering, 2007	
WORKING EXPERIENCE	Senior Web Developer 500px Inc., Toronto, ON, Canada	January 2014 – present
	◇ Programming languages and tools: Ruby on Rails, Go, CoffeeScript, and MarionetteJS.	
	◇ Leads a team of 4 developers.	
	◇ Implements web applications for the online social photography community 500px.com.	
	◇ Designs and implements distributed systems to support photo uploading, post-processing, and storage.	
	◇ Analyzes the pattern of user activities and designs user retention solutions.	
	Technical Consultant EDO Mobile Health, Toronto, ON, Canada	December 2011 – April 2012
	◇ Collaborated with medical professionals to explore the capabilities of mobile devices on helping Alzheimer’s patients.	

- ◇ Provided professional advice to improve the user interface of the **MobiCare for iPhone** (a mobile application to provide collaboration in the medical communities and Alzheimer support groups).

Software Engineer

August 2009

UUSee Inc., Beijing, China

- ◇ Full-time internship.
- ◇ Programming languages and tools: C++, Objective-C, and Xcode.
- ◇ Statistically analyzed the runtime traces of UUSee VoD streaming system, and tuned peer-to-peer streaming protocols to improve the streaming quality and system scalability.
- ◇ Designed the user interface of **UUSee for Mac**.
- ◇ Designed and implemented the prototype of **UUSee for Mac**.
- ◇ Gave lectures about the Objective-C language and development tools in Mac OS X to UUSee employees.

Software Developer

June 2005 – July 2007

Nanjing University of Posts and Telecommunications, Nanjing, Jiangsu, China

- ◇ Part-time on-campus job.
- ◇ Programming languages and tools: C#, .NET Framework, and Visual Studio.
- ◇ Designed and implemented a machine learning algorithm to automate the Chinese keyword extraction. The algorithm can work solely based on a single document, without the support of Chinese dictionary.
- ◇ Implemented the **Library Knowledge Base**, a web-based knowledge database for the university library, featuring online search service, automatic keyword extraction, AI-assisted document classification, etc.

Software Developer and Team Leader

July 2006 – December 2006

Nanjing University of Posts and Telecommunications, Nanjing, Jiangsu, China

- ◇ Part-time on-campus job.
- ◇ Programming languages and tools: C#, ASP.NET, T-SQL, Visual Studio, and Microsoft SQL Server.
- ◇ Led a development team of four students.
- ◇ Architected and implemented the web-based **Information System for Department of Physical Education**, featuring online course registration, grade management, student profile management, etc.
- ◇ Designed the schema of the underlying database, considering datasets with over 16,000 students in 500+ classes at each semester.

Software Developer

September 2005 – October 2005

Nanjing University of Posts and Telecommunications, Nanjing, Jiangsu, China

- ◇ Part-time on-campus job.

- ◇ Programming languages and tools: C (in Linux) and Vim+GCC+GDB.
- ◇ Designed and implemented **vsFTPd Pro**, an FTP server featuring virtual user based access control and file permission management. The **vsFTP Pro** now serves as the master file sharing server in the campus network at Nanjing University of Posts and Telecommunications.

Software Developer

August 2005

Shi-Yue Network Technology Ltd., Beijing, China

- ◇ Full-time internship.
- ◇ Programming languages and tools: Java and Eclipse.
- ◇ Implemented the single sign-on (SSO) plugin for JForum.

Software Developer

July 2004 – August 2004

Liuzhou Locomotive and Rolling Stock Works, Liuzhou, Guangxi, China

- ◇ Full-time internship.
- ◇ Programming languages and tools: Object Pascal, PL/SQL, Borland Delphi, and Oracle.
- ◇ Designed and implemented the **Automatic Update System for the LLRSW Management Information System**.
- ◇ Tuned configurations of Oracle 9i database in Red Hat Enterprise Linux AS 4.
- ◇ Profiled and analyzed PL/SQL queries, optimized long-running queries, and improved the index design, for the **LLRSW Management Information System**.

Software Developer and Team Leader

May 2002 – October 2002

Liuzhou Railway No. 1 High School, Liuzhou, Guangxi, China

- ◇ Part-time on-campus job.
- ◇ Programming languages and tools: Object Pascal, Borland Delphi, and Microsoft Access.
- ◇ Led a development team of three students.
- ◇ Architected and implemented the **Information System for Track-and-Field Competitions**, featuring computer-assisted event scheduling, score management, record management, etc. This piece of software was used in Guangxi Provincial High School Games and many other local high school games.
- ◇ Designed the database schema, considering different teams/players, a wide range of sport events, and corresponding schedules/results/records.
- ◇ Designed algorithms to optimally schedule events in different fields at different timeslots.

HONORS AND
AWARDS

- ◇ *ACM Multimedia 2012 Student Travel Grant*, ACM Special Interest Group on Multimedia, November 2012
- ◇ *SGS Research Travel Grant*, School of Graduate Studies, University of Toronto,

September 2015

May 2011

- ◇ *McLean Graduate Fellow*, University of Toronto, December 2009 – present
- ◇ *Edward S. Rogers Sr. Ontario Graduate Scholarship*, University of Toronto, September 2007 – August 2009
- ◇ *Best Undergraduate Thesis Award*, for the thesis titled “Design and Implementation of HTTP-Based Information Hiding Techniques,” Nanjing University of Posts and Telecommunications, July 2007
- ◇ *Best Undergraduate Thesis Award*, Nanjing University of Posts and Telecommunications, July 2007
- ◇ *Excellent Student Leader Award*, for the outstanding work as the president of *Student Association of Science and Technology*, Nanjing University of Posts and Telecommunications, December 2006
- ◇ *Best Student Volunteer Award*, for the outstanding work as the member of *Anti-Drugs Volunteer Group*, Nanjing University of Posts and Telecommunications, September 2005
- ◇ *Honor Student*, Nanjing University of Posts and Telecommunications, September 2004 – August 2006
- ◇ *First-class Scholarship*, Nanjing University of Posts and Telecommunications, September 2003 – August 2004

PUBLICATIONS

- ◇ **Referred Journal Articles** (in reverse chronological order)

[J2] Yuan Feng, **Zimu Liu**, Baochun Li. “GestureFlow: QoE-Aware Streaming of Multi-Touch Gestures in Interactive Multimedia Applications,” in *IEEE Journal on Selected Areas in Communications, Special Issue on QoE-aware Wireless Multimedia Systems*, vol. 30, no. 7, pp. 1281–1294, August 2012.

[J1] Chunmei Tan, Shiwei Yan, **Zimu Liu**. “Computer-Based Knowledge Management and Automatic Meta-Knowledge Extraction: Design and Implementation,” in *Journal of New Technology of Library and Information Service*, Issue 3, pp. 62–67, March 2008.

- ◇ **Referred Conference Papers** (in reverse chronological order)

[C9] **Zimu Liu**, Yuan Feng, Baochun Li. “Bellini: Ferrying Application Traffic Flows through Geo-distributed Datacenters in the Cloud,” to appear in the Proceedings of the IEEE Global Communications Conference (*IEEE GLOBECOM 2013*), Atlanta, GA, USA, December 9–13, 2013 (acceptance ratio: **37%**).

[C8] **Zimu Liu**, Yuan Feng, Baochun Li. “MusicScore: Mobile Music Composition for Practice and Fun,” in the Proceedings of the 20th ACM Multimedia, Nara, Japan, October 29–November 2, 2012 (acceptance ratio: **20%**).

[C7] **Zimu Liu**, Yuan Feng, Baochun Li. “Socialize Spontaneously with Mobile Applications,” in the Proceedings of the 31st IEEE International Conference on Computer Communications (*IEEE INFOCOM 2012*), Orlando, FL, USA, March 25–30, 2012

(acceptance ratio: **18%**).

[C6] **Zimu Liu**, Yuan Feng, Baochun Li. “When Multi-Touch Meets Streaming,” in the Proceedings of the 10th International Conference on Mobile and Ubiquitous Multimedia (*MUM 2011*), Beijing, China, December 7–9, 2011.

[C5] Yuan Feng, **Zimu Liu**, Baochun Li. “GestureFlow: Streaming Gestures to an Audience,” in the Proceedings of the 30th IEEE International Conference on Computer Communications (*IEEE INFOCOM 2011*), Shanghai, China, April 11–15, 2011 (acceptance ratio: **16%**).

[C4] Di Niu, **Zimu Liu**, Baochun Li, Shuqiao Zhao. “Demand Forecast and Performance Prediction in Peer-Assisted On-Demand Streaming Systems,” to appear in the Proceedings of the 30th IEEE International Conference on Computer Communications (mini-conference, *IEEE INFOCOM 2011*), Shanghai, China, April 10, 2011 (acceptance ratio: **23%**, together with the main conference).

[C3] **Zimu Liu**, Chuan Wu, Baochun Li, Shuqiao Zhao. “UUsee: Large-Scale Operational On-Demand Streaming with Random Network Coding,” in the Proceedings of the 29th IEEE International Conference on Computer Communications (*IEEE INFOCOM 2010*), San Diego, CA, USA, March 15–19, 2010 (acceptance ratio: **18%**).

[C2] **Zimu Liu**, Chuan Wu, Baochun Li, Shuqiao Zhao. “Why Are Peers Less Stable in Unpopular P2P Streaming Channels?” in the Proceedings of *IFIP Networking 2009*, Aachen, Germany, May 11–15, 2009 (acceptance ratio: **20%**).

[C1] **Zimu Liu**, Chuan Wu, Baochun Li, Shuqiao Zhao. “Distilling Superior Peers in Large-Scale P2P Streaming Systems,” in the Proceedings of the 28th IEEE International Conference on Computer Communications (*IEEE INFOCOM 2009*), Rio de Janeiro, Brazil, April 19–25, 2009 (acceptance ratio: **20%**).

TEACHING
EXPERIENCE

Teaching Assistant (Lab TA)

Communication Design, ECE297, University of Toronto
Spring 2013

- ◇ This is a second-year undergraduate course, helping students to develop professional skills for engineering design, software engineering, design and development, and professional communication.
- ◇ Duties: supervised weekly labs, gave technical lecture about concurrent programming, marked programming assignments, quizzes and exams.

Teaching Assistant (Lab TA)

Operating Systems, ECE344, University of Toronto
Spring 2009, Spring/Fall 2010, Spring/Fall 2011, Spring 2012

- ◇ This is a third-year undergraduate course, introducing the principles in the design and implementation of operating systems. Its topics include: introduction to operating systems concepts, processes and threads, concurrency and synchronization,

scheduling, deadlocks, memory management, input/output and file systems.

- ◇ Duties: supervised weekly labs, marked programming assignments and exams.

Teaching Assistant (Lab Automarker TA)

Computer Fundamentals, APS105, University of Toronto
Fall 2010, Fall 2011, Fall 2012

- ◇ This is a first-year undergraduate course, introducing C programming language and fundamentals of algorithms and data structures.
- ◇ Duties: designed automated marking scripts using python and perl, marked programming assignments of 400+ students.

Teaching Assistant (Head TA)

Computer Fundamentals, APS105, University of Toronto
Fall 2009

- ◇ This is a first-year undergraduate course, introducing C programming language and fundamentals of algorithms and data structures.
- ◇ Duties: managed a group of 20+ TAs, managed various workflows related to APS105.

Teaching Assistant (Tutorial TA)

Computer Fundamentals, APS105, University of Toronto
Spring/Fall 2008

- ◇ This is a first-year undergraduate course, introducing C programming language and fundamentals of algorithms and data structures.
- ◇ Duties: gave weekly tutorials, marked quizzes and exams.

UNIVERSITY
ACTIVITIES

- ◇ **System Administrator**, *iQua Research Group*, Department of Electrical and Computer Engineering, University of Toronto, September 2007 – present
- ◇ **Chair**, *Committee of the First Student's Science and Technology Competition*, Department of Computer Science, Nanjing University of Posts and Telecommunications, November 2005
- ◇ **Member**, *Server Maintenance Group*, Campus Network Center, Nanjing University of Posts and Telecommunications, September 2005 – July 2007
- ◇ **Member**, *Anti-Drugs Volunteer Group*, Nanjing University of Posts and Telecommunications, July 2005 – August 2005
- ◇ **President**, *Student Association of Science and Technology*, Department of Computer Science, Nanjing University of Posts and Telecommunications, June 2005 – May 2006
- ◇ **Member**, *Student Association of Science and Technology*, Department of Computer Science, Nanjing University of Posts and Telecommunications, October 2003 – May 2005