

Ruilin Liu

Education

Aug. 2012- present	Department of Computer Science, Rutgers University Ph.D. student GPA: 4.0/4.0	Piscataway, NJ Advisors: Prof. Liviu Iftode
Sept. 2009- Jun. 2012	Department of Computer Science and Technology, Tsinghua University M.S. in Computer Science and Technology GPA: 3.5/4.0 Thesis: Research on Distributed Slot Reservation MAC for Vehicular Ad-hoc Network	Beijing, China Advisors: Prof. Yong Xiang
Sept. 2004- Jun. 2008	School of Software, Shandong University B.S. in Computer Science and Technology (Software) GPA: 87.53/100	Jinan, China Advisors: Prof. Qinghua Shi

Professional Experiences

Sept. 2014 - present	Autonomous Driving through Vehicle Teleoperation <ul style="list-style-type: none">• Aimed at providing a hybrid autonomous driving solution using both robotic control and remote human control to ensure both the safety and cost-effectiveness.• Built an autonomous driving prototype by hacking a RC car and control it with an onboard Android device, which works as a proxy to carry out the driving command from the remote driver and collects sensory data (e.g., video feeds) to send to the remote driver via wireless communication for the use of driving environment perception (Programmed in Java and C++).	Leading researcher
Apr. 2013 - present	City-scale Balanced Vehicle Routing Algorithm and System <ul style="list-style-type: none">• Proposed a balanced routing system that changes the greedy routing based on real-time traffic into a balanced way which minimizes the average travel time of all drivers in a city.• Built the prototype system including an Android application and an online balanced routing service based on OpenStreetMap (Programmed in Java and C++).• Tested the system using the data from over 26,000 taxis in Beijing and proved ability of the system to reduce as much as 15% of average travel time.	Leading researcher
Dec. 2012- Apr. 2013	NaviTweet: Social Navigation Based on Driver-provided Multimedia Tweets <ul style="list-style-type: none">• Developed an Android application which collects voice and image tweets from drivers and then delivered relevant tweets to other drivers (Programmed using Java with Google Maps API).	Leading researcher
Dec. 2010- May. 2012	Distributed Slot Reservation MAC Protocol for Vehicular Ad-hoc Networks <ul style="list-style-type: none">• Proposed a time-slot reservation based MAC algorithm supporting dynamically slot reassignment and CSMA in TDMA channel to improve wireless channel availability, which guaranteed over 95% MAC layer packet delivery rate in large-scale simulations.• Implemented a synchronized MAC protocol testbed, which runs uClinux on Nios II based SOPC to control a RF module and establishes the synchronization among testbeds based on their interactive wireless communications. (Programmed in C, C++ and VHDL).	Leading researcher
Feb. 2011- Jul. 2011	GeoSVR: Geographic Stateless VANET Routing <ul style="list-style-type: none">• Assisted in designing and evaluating a geographic routing protocol which combined geo-location and digital map with restricted forwarding algorithm to overcome unreliable wireless channel.• Filtered packets from TCP/IP stack using Netfilter and implemented a kernel module, which communicated with our protocol core process in user space using Netlink (Programmed in C and C++).	Research Assistant
Mar. 2010- Nov. 2010	Floating car based Urban Traffic Monitor <ul style="list-style-type: none">• Developed a P2P on-board traffic monitor & viewer which calculated and delivered real-time traffic conditions with the help of GPS device and MapInfo GIS (Programmed in JAVA).	Leading researcher

Other Projects

- Sept. 2012 – Developed an education dedicated webpage search engine using Hadoop MapoReduce and HBase
Dec. 2012 (Programmed in JAVA, shell scripts and PHP).
Mar. 2010 - Implemented the UFS file System and Condition variable mechanism in Ucore, a simple Unix-like
Mar. 2011 teaching operating system based on MIT's Xv6 system. (Programmed in C and C++).
Mar. 2010- Helped design and evaluate FRBP: a FEC-based Reliable Data-link Layer Broadcast Protocol for Mobile
Jul. 2010 Ad-hoc Networks (Programmed in C and C++).
Dec. 2006- Collaborated with four group members to finish Handplat: a Vector Map Editor in Windows and
Nov. 2007 corresponding map viewer in Symbian. (Programmed in JAVA).

Honors and Awards

- Jun. 2012 Nomination for Outstanding Master-Degree Thesis of Tsinghua University
Jun. 2012 Excellent Graduate of Dept. of Computer Science, Tsinghua University
Nov. 2011 Second Prize Scholarship in Tsinghua University (Top 10%)
Nov. 2007 National Inspirational scholarship in China
Nov. 2007 First prize for Tech Innovation in Software College, Shandong University (usually one group per year)
Nov. 2007 Second Prize Scholarships for Outstanding Student in Shandong University (Top 10%)
Nov. 2006 Second Prize Scholarships for Outstanding Student in Shandong University (Top 10%)
May 2006 Innovation Advanced Student of Shandong University

Selected Publications

- **R. Liu**, D. Kwak, S. Devarakonda, et al. "A Remote-Driving Experiment: Prelude to Teleoperated Cars on the Road." Submitted to the 16th Workshop on Mobile Computing Systems and Applications (HotMobile). Feb., 2015.
- **R. Liu**, H. Liu, D. Kwak, et al. "Themis: A Participatory Navigation System for Balanced Traffic Routing." In the Proceedings of 2014 IEEE Vehicular Networking Conference (VNC), Dec. 2014.
- **R. Liu**, Y. Xiang, Y. Yang. "MARR-ALOHA: A Mobility Adaptive Variety of RR-ALOHA for Vehicular Ad-hoc Networks". In the Proceeding of the 2nd International Conference on Consumer Electronics, Communications and Networks (CECNet), Apr., 2012.
- **R. Liu**, and Y. Xiang. "Analysis and comparison of MAC protocols in vehicular ad-hoc networks." Journal of Computer Application 31, no. A02 (2012): 5-8.
- D. Kwak, D. Kim, **R. Liu**, et al. "DoppelDriver: Counterfactual Actual Travel Time for Alternative Routes." Accepted in the IEEE International Conference on Pervasive Computing and Communications (PerCom), Mar. 2015.
- D. Kwak, D. Kim, **R. Liu**, et al. "Tweeting Traffic Image Reports on the Road." In the Proceedings of the 6th International Conference on Mobile Computing, Applications and Services (MobiCase), Nov. 2014.
- S. Devarakonda, P. Sevusu, H. Liu, **R. Liu**, et al. "Real-time air quality monitoring through mobile sensing in metropolitan areas." In the 2nd ACM SIGKDD International Workshop on Urban Computing (Urbcomp), Aug., 2013.
- Y. Xiang, Z. Liu, **R. Liu**, et al. "GeoSVR: A map-based stateless VANET routing." Ad Hoc Networks 11, no. 7 (2013): 2125-2135.

Skills

Programing Platforms: Linux, Windows, and Android.

Programming Languages:

- Proficient in Java, C/C++, VHDL;
- Experience with Hadoop, Hbase, PHP, JSP, Unix Shell scripts, and Gawk.