

Zhao Tian

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Academic Background

- **Dartmouth College** Hanover, New Hampshire, United States
• *Ph.D. in Computer Science* Sept. 2014 – Jun. 2019 (expected)
 - working under the supervision of Prof. Xia Zhou at DartNets (Dartmouth Networking and Ubiquitous Systems) Laboratory
 - wireless networking and mobile system, specifically in visible light communication/sensing and spectrum monitoring
- **Peking University** Beijing, China
• *Bachelor of Science in Computer Science* Sept. 2009 – Jul. 2013
 - core courses: Compiler, Operating system, Architecture, Computer network; Linear algebra, Calculus, Graph theory, Probability and statistics, Stochastic process; Data structure, Algorithm design & analysis; Digital logic
 - worked with Prof. Tao Wang and Prof. Guojie Luo at Center for Energy-Efficient Computing and Applications (CECA) of Peking University since sophomore, on reconfigurable computing, specifically FPGA architecture and tool chain
 - Bachelor of Arts (minor) in Economics (National School of Development)
- **UCLA (University of California, Los Angeles)** Los Angeles, California, United States
• *Research-Exchange Student in Department of Computer Science* Sept. 2012 – Jan. 2013
 - sponsored by the Joint Research Institute in Science and Engineering of Peking University and UCLA
 - worked on reconfigurable computing with Prof. Jason Cong and Dr. Kalliopi Tsota at UCLA VLSI CAD Laboratory (now VLSI Architecture, Synthesis, and Technology (VAST) Laboratory)

Appointments

- **Bell Labs, Nokia** Cambridge, United Kingdom
• *Research Intern* May 2017 – Aug. 2017
 - worked under the supervision of Dr. Fahim Kawsar. Wi-Fi sensing using channel state information (CSI). devised a multi-node CSI infrastructure and engineered features for occupancy detection.
- **University of Cambridge** Cambridge, United Kingdom
• *Visiting Researcher* Oct. 2016 – Dec. 2016
 - collaborated with Prof. Cecilia Mascolo. designed and implemented a infrared badge to sense interpersonal interactions. Our wearable device can sense the relative angles, in addition to distances, between people. deployed the devices in user studies to investigate the social implication of users' non-verbal behavior.

Honors & Awards

- **HotMobile Travel Grant** NSF, 2016
- **Second Place in ACM Student Research Competition** ACM MobiCom, 2015
- **Neukom Travel Grant** Neukom Institute, 2015
- **International Scholarship for Outstanding Undergraduates** China Scholarship Council, 2012
 - sponsored by Ministry of Education, China to do research overseas: stipend, travel expense, and insurance
 - the only winner from School of EECS; 13 from Peking University; 289 nationwide (all disciplines included)
- **May Fourth Scholarship** Peking University, 2012

Publications

- **Position: Augmenting Inertial Tracking with Light**
Z. Tian, Y. Wei, X. Xiong, W. Chang, H. Tsai, K. Lin, C. Zheng, X. Zhou
4th ACM Workshop on Visible Light Communication Systems (VLCS 2017)
- **The DarkLight Rises: Visible Light Communication in the Dark**
Z. Tian, K. Wright, and X. Zhou
Proceedings of 22nd Annual International Conference on Mobile Computing and Networking (MobiCom'16)
Best Video Award

- **Lighting Up the Internet of Things with DarkVLC**
Z. Tian, K. Wright, and X. Zhou
Proceedings of 17th International Workshop on Mobile Computing Systems and Applications (HotMobile'16)
- **Human Sensing Using Visible Light Communication**
T. Li, C. An, Z. Tian, A. Campbell, and X. Zhou
Proceedings of 21st Annual International Conference on Mobile Computing and Networking (MobiCom'15)
Best Video Award
- **Visible Light Knows Who You Are**
C. An, T. Li, Z. Tian, A. Campbell, and X. Zhou
Proceedings of 2nd ACM Workshop on Visible Light Communication systems (VLCS'15)

Professional Activities

- **Technical Program Committee**
ACM S³ 2017
- **Reviewer**
UbiComp 2017, 2018

Research Experience

- **Visible Light Communication in the Dark** DartNets
supervised by Prof. Xia Zhou *Mar. 2015 – Current*
 - We devise a new visible light communication (VLC) primitive: VLC in the dark, where the communication sustains even when the LED light appears dark
 - The key idea is to encode data into ultra-short light pulses imperceptible to human eyes yet detectable by devices equipped with photodiodes.
 - We build a preliminary prototype to demonstrate its feasibility. Our current single link achieves 1.77 kbps data rate with 46.8 μ W power consumption at the LED
- **Human Sensing Using Visible Light Communication** DartNets
supervised by Prof. Xia Zhou *Dec. 2014 – Mar. 2015*
 - A device-free 3D posture reconstruction system leveraging visible light communication
 - We embedded 324 photodiodes on the floor to capture the shadows of the user cast by the LED lights mounted on the ceiling and used an optimization algorithm to compute the vectors of body segments
 - Our system achieved 10° mean angular error
- **Novel FPGA Architecture and its Tool Chain** CECA
Supervised by Prof. Tao Wang and Prof. Guojie Luo *Jul. 2011 – Mar. 2014*
 - Our project aims to facilitate time-multiplexing dedicated logic blocks in FPGA. We incorporate SPFUs (Sequential Programmable Functional Units), a DSP-like component with built-in dedicated control logic, into FPGA. We are using wireless applications to show its advantage.
 - I contributed to design the prototype of SPFU, which is comprised of ALU, register file and a sequencer.
 - I was in charge of the tool-chain for our heterogeneous FPGA. In order to support SPFU, I tailored VPR, an academic FPGA flow from the University of Toronto and also developed a Verilog-to-BLIF logic elaborator to replace the the old one in VPR.
 - I conducted the experiments using my flow to evaluate our new FPGA, which achieved a higher area efficiency than DSP-based FPGA.

Teaching Assistant Experience

- **COSC50: Software Design and Implementation** *Winter and Spring 2015, Dartmouth*
 - held office hours, led lab sessions, graded labs and course projects, and shepherded course projects
- **COSC 30: Discrete Mathematics in Computer Science** *Fall 2014, Dartmouth*
 - held office hours, graded and wrote solutions for assignments and exams, and explained the exams

Technical Skills

- **Programming Language** **Proficient:** C/C++, Java, Python, MATLAB, Shell script;
- **Hardware Description Language** Verilog
- **System & Tools** GNU/Linux, Make, Vim, gprof, Git, L^AT_EX, gnuplot, GNU Radio
- **FPGA Platform** Xilinx Vivado, Xilinx Vivado HLS