

Chuchu Fan

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HOME PAGE <http://chuchufan.info/>

EDUCATION **Ph.D., Department of Electrical and Computer Engineering**, Aug. 2013-present
University of Illinois at Urbana-Champaign

- Accumulated GPA: 3.95/4.0

B.S., Department of Automation, Sep. 2009-Jul. 2013

Tsinghua University

- Score: 91.5/100

ACADEMIC **Research Assistant**, Aug. 2013-Present

EXPERIENCE *Department of Electrical and Computer Engineering, UIUC*

- Advisor: Prof. Sayan Mitra

Project: Verification of general nonlinear hybrid systems

Research Assistant, Aug. 2012-Jul. 2013

Institute of Digital Interactive Technology, Tsinghua University

- Advisor: Prof. Haiming Lu

Project: Motion-based gesture recognition

Visiting Scholar, Jun. 2012-Aug. 2012

iLab, Department of Computer Science, University of Southern California

- Advisor: Prof. Laurent Itti

Project: Speed control system design for Beobot 2.0

Research Assistant, Jul. 2011–Mar. 2012

Institute of Control Theory and Technology, Tsinghua University

- Advisor: Prof. Mingguo Zhao

Project: Student research training program

WORKING **Technical Director**, Jan. 2016-Jun. 2016

EXPERIENCE *Research and Development group, Rational Cyphy Inc., Champaign, IL, U.S.*

Project: Development and commercialization of formal verification tool C2E2

Research Intern, Jan. 2015-May. 2015

Model Based Development group, Toyota Technical Center, Los Angeles, CA, U.S.

- Mentor: James Kapinski

Project: Reach set analysis for parametric nonlinear systems

Research Intern, Feb. 2012-Jun. 2012

Mobile and Sensing Systems group, Microsoft Research Asia(MSRA), Beijing, China

- Mentor: Xiaofan Jiang

Project 1: LiveSynergy

A wireless proximity detection platform to provide cloud-based APIs that enable real-time interactions between humans and their physical environment

Project 2: SEPTIMU

A novel wearable system to provide with real-time human wellness monitoring and feedback

GRANTS

G3. **[PI]** NSF SBIR-1549058 SBIR Phase I: Debugging Smart Cyberphysical Systems

G2. **[Awardee]** Summer 2016, Travel Scholarship to Attend the Verification Mentorship Workshop (VMW 2016) and the CAV Conference

G1. **[Awardee]** Fall 2015, Conference Travel Grant from UIUC College of Engineering

PATENTS

P2. Bounded Verification through Discrepancy Computations. TF14195-02(US), granted Feb. 2016

P1. Image Super-Resolution via Analysis Sparse Prior. CN103049885, granted Apr. 2013.

PUBLICATION

Journal Papers

J3. Zhenqi Huang, Chuchu Fan, and Sayan Mitra. *Bounded Invariant Verification for Time-Delayed Nonlinear Networked Dynamical Systems*, IFAC Nonlinear Analysis: Hybrid Systems, 2016.

J2. Zhenqi Huang, Chuchu Fan, Alexandru Mereacre, Sayan Mitra, and Marta Kwiatkowska. *Simulation-based Verification of Implantable Medical Devices with Guaranteed Coverage*, Design & Test, IEEE, vol.32, no.5, pp.27-34, Oct. 2015.

J1. Qiang Ning, Kan Chen, Li Yi, Chuchu Fan, Yao Lu, Jiangtao Wen, *Image Super-Resolution via Analysis Sparse Prior*, IEEE Signal Processing Letters 2013.

Conference Papers

C7. Chuchu Fan, James Kapinski, Xiaoqing Jin and Sayan Mitra. *Locally Optimal Reach Set Over-approximation for Nonlinear Systems*, International Conference on Embedded Software (EMS OFT) 2016. **[Best Paper Finalist]**

C6. Chuchu Fan, Bolun Qi, Sayan Mitra, Mahesh Viswanathan and Parasara Sridhar Duggirala. *Automatic reachability analysis for nonlinear hybrid models with C2E2*, Computer-Aided Verification (CAV) 2016.

- C5. Chuchu Fan and Sayan Mitra. *Bounded Verification with On-the-Fly Discrepancy Computation*, Automated Technology for Verification and Analysis (ATVA) 2015.
- C4. Md. Ariful Islam, Richard DeFrancisco, Chuchu Fan, Radu Grosu, Sayan Mitra and Scott Smolka. *Model Checking Tap Withdrawal in C. Elegans*. Hybrid Systems Biology (HSB) 2015.
- C3. Parasara Sridhar Duggirala, Chuchu Fan, Sayan Mitra, and Mahesh Viswanathan. *Meet a Powertrain Verification Challenge*, Computer-Aided Verification (CAV) 2015.
- C2. Chuchu Fan, Parasara Sridhar Duggirala, Sayan Mitra, and Mahesh Viswanathan. *Progress on Powertrain Verification Challenge with C2E2**, Applied Verification for Continuous and Hybrid Systems (ARCH) 2015 [**Best Verification Result Award**].
- C1. Zhenqi Huang, Chuchu Fan, Alexandru Mereacre, Sayan Mitra, and Marta Kwiatkowska. *Invariant verification of nonlinear hybrid automata networks of cardiac cells*, Computer-Aided Verification (CAV) 2014.

TALKS

- T6. *Locally optimal reach set over-approximation for nonlinear systems*, Embedded Systems Week, Oct. 2016. Pittsburgh, Pennsylvania
Feedback Friday, Oct. 2016. Urbana, Illinois
- T5. *Automatic reachability analysis for nonlinear hybrid models with C2E2*, Computer-Aided Verification 2016, Jul. 2016.
Toronto, Canada
- T4. *Verification of Cyber-physical systems*, French-American Doctoral Exchange Seminars, Jul. 2016. Grenoble, France.
Coordinated Science Laboratory Social Hours, Oct. 2015.
University of Illinois at Urbana-Champaign, Urbana, Illinois.
- T3. *Bounded Verification with On-the-Fly Discrepancy Computation*, Intl. Symposium on Automated Technology for Verification and Analysis, Oct. 2015.
Shanghai, China.
- T2. *Local Discrepancy Computation in Simulation-guided Verification*, Midwest Verification Day, Oct. 2015.
University of Illinois at Urbana-Champaign, Urbana, Illinois.
- T1. *Progress on Powertrain Verification Challenge with C2E2**, Applied Verification for Continuous and Hybrid Systems, Apr. 2015.
Seattle, Washington.

SERVICES

- Reviewer/Subreviewer for
- R7. 28th International Conference on Computer Aided Verification (CAV 2016)
- R6. 7th Intl. Conf. on Cyber-Physical Systems (ICCPS 2016)
- R5. 18th ACM Intl. Conf. on Hybrid Systems: Computation and Control (HSCC 2015, 2016, 2017)

- R4. IEEE Real-Time Systems Symposium (RTSS 2014, 2016)
- R3. Workshop on Applied Verification for Continuous and Hybrid Systems (ARCH 2015)
- R2. 13th Intl. Conf. on Formal Modeling and Analysis of Timed Systems (FORMATS 2015)
- R1. 11th Intl. Conf. on Quantitative Evaluation of Systems (QEST 2014)

**HONORS
& AWARDS**

Selected Participant of Rising Stars Program	Oct. 2016
Rambus Computer Engineering Fellowship	Apr. 2016
Robert Bosch Best Verification Result Award	Apr. 2015
Excellent Graduate of Tsinghua University (Top 5%)	Jul. 2013
First-class Scholarship honored by the Soar Foundation	Oct. 2012
Third Price in Challenge Cup of Tsinghua (5%)	Mar. 2012
Best Hardware Award in Electronic Design Competition in Tsinghua (Top 1)	Dec. 2011
First-class Scholarship honored by <i>SAMSUNG</i>	Oct. 2011
First Price in the Project of Electronic Circuits (1%)	Sep. 2010
Gold Medal in Excellent Social Practice Team (1%)	Mar. 2010
National Math Competition in Shaanxi Province (3%)	Oct. 2008
National Physics Competition in Shaanxi Province (3%)	Oct. 2007

**MENTORING,
LEADERSHIP
& ACTIVITIES**

Selected U.S. PhD in CPS, Jul. 2016
French-American Doctoral Exchange Program (FADEX), France

Research Mentor, Aug.2015-Present

Department of Electrical and Computer Engineering, UIUC

- Undergraduate Student: Bolun Qi. Project: C2E2 0.2: Automatic verification of hybrid systems
- Undergraduate Student: Yu Meng. Project: Modeling and verification of hybrid models

Female Researcher in Computer Reach Association, Apr. 2016

Grad Cohort Workshop, San Diego, CA

Vice Chair, Jul. 2010-Jul. 2012

Automation Student Association of Science and Technology (ASAST), Tsinghua University, Beijing, China

- Took charge of most the technology activities for over 600 students
- Directed the Future Intelligent Robot Club sponsored by Texas Instruments

Team Leader, Oct. 2010-Oct. 2011

National Electronic Design Competition, Beijing, China

- Took responsibility for hardware part of the robot
- Individual Best Hardware Award and National Third Award

Volunteer Lecturer, Jun. 2010-Sep. 2010

ChunLei Education Support Program, Wantang School, Jianshui, Yunnan, China