

Abhishek Kulkarni

Curriculum Vitae

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Research Interests

- Formal Methods for Robotics.
- Automated Reasoning.
- Reactive Synthesis.
- Game and Hypergame Theory.
- Mission/Task Planning.
- Algorithmically Complete Motion Planning.

Education

- Aug'16 - M.S./Ph.D. in Robotics Engineering,**
Present Advisor: Prof. Jie Fu
Worcester Polytechnic Institute (WPI), Worcester, MA, USA, **CGPA – 3.71/4.0.**
- Aug'12 - Bachelor of Technology in Electronics and Telecommunication Engineering,**
May'16 Vishwakarma Institute of Technology (VIT), Pune, India, **CGPA – 8.72/10.0.**

Journal Publications

- 2020** **Abhishek N. Kulkarni**, Huan Luo, Nandi O. Leslie, Charles A. Kamhoua, and Jie Fu, *Deceptive Labeling: Hypergames on Graphs for Stealthy Deception*, IEEE Control Systems Letters (L-CSS). (accepted)

Conference Publications

- 2020** **Abhishek N. Kulkarni** and Jie Fu, *Synthesis of Deceptive Strategies in Reachability Games with Action Misperception*, International Joint Conference on Artificial Intelligence (IJCAI), 2020. (accepted)
- 2019** **Abhishek N. Kulkarni** and Jie Fu, *Opportunistic Synthesis in Reactive Games under Information Asymmetry*, Conference on Decision and Control (CDC), 2019.
- 2018** **Abhishek N. Kulkarni** and Jie Fu, *A Compositional Approach to Reactive Games under Temporal Logic Specifications*, Annual American Control Conference (ACC), 2018.
- 2015** Siddharth Nitin Patki, Madhura Joshi and **Abhishek N. Kulkarni**, *Dot Matrix Text Recognition for Industrial Carton Classification*, International Conference on Industrial Instrumentation and Control (ICIC), 2015.
- 2014** **Abhishek N. Kulkarni**, Anita S. Joshi and Satish R. Inamdar, *Big Data Management of a Cyber-Physical Multi-location Chemical Factory*, International Journal of Industrial Electronics and Electrical Engineering (IJIEEE), vol. 2, issue 8, pp. 9-14, Aug. 2014.

Professional Activities

- Reviewer for IEEE Transactions of Automatic Control.
- Reviewer for IEEE Conference on Decision and Control.
- Member of the Dean of the Global School Search Committee at WPI.
- Student Representative for Robotics Engineering Program to School of Arts and Sciences Graduate Advisory Council at WPI.
- Student Representative to Graduate Student Government (GSG) for Robotics Engineering Program at WPI.

Teaching and Leadership Roles

- Fall'19 Guest lecturer for *RBE595: Formal Method in Robotics* course for Prof. Jie Fu.
- Spring'18 TA for *ECE2799: Electrical and Computer Engineering Design* in Term-B for Prof. Shamsur Mazumder.
- Spring'18 TA for *ECE2019: Sensors, Circuits and Systems* in Term-A for Prof. Shamsur Mazumder.
- Spring'17 Talk on *An Informal Introduction to Formal Methods* for the robotics honor society, Rho-Beta-Epsilon.
- Summer'15 Designed and taught *Embedded Systems Programming with Arduino* at Cognitive Robotics and Intelligent SysTems Lab (CRISTL) group at VIT.
- Fall'15 Organized a 6-day workshop on *Image Processing using OpenCV* by Anand Muglikar as part of CRISTL.
- Summer'14 Founded and led CRISTL group at VIT with focus on theoretical aspects of robotics.

Industry Experience

- Aug'17 - Robotics Research Intern, NodeIn Inc..**
- Dec'17** ◦ Developed provably-correct motion planning algorithm for quadcopter traveling in urban environment using formal methods approach.
- May'17 - Hardware-Software Intern, Mathworks.**
- Aug'17** ◦ Extended MATLAB's hardware support for Arduino with additional sensors.

Skills

- Languages** Python, C/C++, Embedded C, VB.NET, Shell Script.
- Tools** Robot Operating System (ROS), Gazebo, OpenCV, MATLAB, Visual Studio, Unity3D, L^AT_EX, GitHub.
- Embedded Platforms** AVR, BeagleBone Black, Raspberry Pi, Arduino, NVidia Jetson TX2.

Selected Honors/Awards

- 2014-2016 Research Grant from Board of College and University Development (BCUD)** for developing a Low-cost Educational Robotics Platform: Curio.