

# 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** Worcester Polytechnic Institute (WPI), Worcester, MA, USA, **CGPA - 3.67/4.0.**
- Aug'12 - Bachelor of Technology in Electronics and Telecommunication Engineering,**  
**May'16** Vishwakarma Institute of Technology (VIT), Pune, India, **CGPA - 8.72/10.0.**

### 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.

### Conference Publications

- 2019** **Abhishek N. Kulkarni** and Jie Fu, *Opportunistic Synthesis in Reactive Games under Information Asymmetry*, Conference on Decision and Control (CDC), 2019. (accepted)
- 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.

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## 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.

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## Skills

**Languages** Python, C/C++, Embedded C, VB.NET, Shell Script.

**Tools** Robot Operating System (ROS), Gazebo, OpenCV, MATLAB, Visual Studio, Unity3D, L<sup>A</sup>T<sub>E</sub>X, GitHub.

**Embedded Platforms** AVR, BeagleBone Black, Raspberry Pi, Arduino, NVidia Jetson TX2.

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## Selected Honors/Awards

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