

Anand Balakrishnan

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📍 Los Angeles, CA, USA

EDUCATION

- **Ph.D. Computer Science** *Ongoing*
University of Southern California
Advisor: *Jyotirmoy Deshmukh*
- **B.S. Computer Engineering** *May 2018*
University at Buffalo
Distinction: *Magna Cum Laude*

RELEVANT EXPERIENCE

- **Research Assistant**
CPS-VIDA Group, University of Southern California
Developed and published several algorithms for designing, verifying, and monitoring learning-enabled systems. Key research topic is to define end-to-end safety frameworks for autonomous systems.
Since August 2018.
- **ADAS Software Engineering Intern**
INDI EV, Inc.
Assisted in building the initial prototype for Level 2 autonomy from the ground up on a test vehicle as part of a small team. Networked RADAR and camera systems via CAN buses and implemented preliminary adaptive cruise control platform.
June 2021 – August 2021
- **Research Intern**
Toyota Research Institute, North America
Developed open-source tool that uses a logical monitoring specification languages for monitoring the output of perception systems, specifically, object detectors and trackers.
May 2020 – August 2020
- **Undergraduate Researcher**
Distributed Robotics and Networked Embedded Systems Lab, University at Buffalo
Deployed a ROS-based system to collect data to assist in testing the performance of Wi-Fi augmented SLAM algorithms in indoor environments.
February 2016 – May 2018

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- For more information regarding my research, please refer my DBLP page: dblp.org/pid/132/8908
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SKILLS

- **Expert (5+ years):** C++ (11, 14, 17), Python, ROS (1, 2), PyTorch, Numpy, Scipy, Pandas
- **Intermediate (2+ years):** C (99, 11, 17), Rust
- **Familiar (<1 year):** Matlab, ARM Assembly
- **Hobby:** Zig, Haskell, Lua, FreeRTOS, Arduino

PROJECTS

- **PerceMon**
[GitHub: [anand-bala/PerceMon](https://github.com/anand-bala/PerceMon)]
A tool for online monitoring of perception systems using Spatio-Temporal Quality Logic specifications.
C++, (Ongoing port) Rust
- **Signal Temporal Logic**
[GitHub: [anand-bala/signal-temporal-logic](https://github.com/anand-bala/signal-temporal-logic)]
A library for efficiently working with Signal Temporal Logic (STL) and its quantitative semantics.
C++, Python
- **Symbolic Automata Monitors**
[GitHub: [anand-bala/symbolic-automata-monitors](https://github.com/anand-bala/symbolic-automata-monitors)]
Library implementing symbolic automata for monitoring real-valued signals.
Python

RESEARCH EXPERIENCE

- **Logical Specification-Guided Reinforcement Learning**
 - Develop algorithms with probabilistic guarantees for reinforcement learning agents with temporally extended tasks with formal specifications.
- **Safety Evaluation and Monitoring of Perception Systems**
 - Developed monitoring algorithms for data streams generated by perception algorithms like object tracking and object detection.
 - Developed a toolbox to specify logical specifications on perception systems, and monitor their output when on testing datasets and at runtime.
- **Trust-Aware Autonomy**
 - Developing framework to use runtime monitors to evaluate trustworthiness of learning-enabled components in autonomous systems and modulate their control over the system.