

# Suhan Shetty

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## Summary

I use machine learning and control theory to develop efficient algorithms for robot learning.

## Education

June 2019 – **Doctor of Philosophy.**  
Now École Polytechnique Fédérale de Lausanne  
**Thesis:** Robot Learning using Tensor Networks

June 2014– **Master of Engineering.**  
June 2016 Indian Institute of Science, Bangalore, India  
**Thesis:** Trajectory Tracking and Control of Car-like Robots

## Work Experience

June 2019 – **Idiap Research Institute, Martigny, Switzerland.**  
Now *Research Assistant at Robot Learning and Interaction Group*  
Developing fast and memory efficient algorithms for robot exploration as used in the project [CoLLaboratE](#) for industrial assembly tasks, reinforcement learning and fast optimization algorithms as used in projects [Learn-Real](#) and [MEMMO](#) for robot control and motion planning.

2023 June – **Disney Research Studios, Zurich, Switzerland.**  
September *Research Intern*  
Developed deep reinforcement learning algorithms for concurrently learning the policy and state estimator for robust locomotion of [bipedal robots](#).

Oct 2018 – **Robert Bosch Center for Cyber-Physical Systems, Bangalore, India.**  
April 2019 *Research Associate*  
Applied reinforcement learning to generate walking gaits for an in-house manufactured quadruped robot called [Stoch](#).

July 2016 – **The MathWorks Inc., Bangalore, India.**  
Mar 2018 *Engineering Development Group*  
Developed MATLAB and Simulink based models for demonstrating the applicability of MATLAB products such as Control System Toolbox, Robotics System Toolbox and Automated Driving System Toolbox in robotics applications.

## Programming Skills

- Languages: Python, C++, MATLAB
- Frameworks: Pytorch, Tensorflow, JAX, ROS, Git, LaTeX, Unix
- Robotic Simulators: Mujoco, Pybullet, NVIDIA Isaac Gym

## Technical Courses

- Robotics: Robot Control, State Estimation, and System Identification
- Machine Learning: Numerical Optimization, Deep Learning, Reinforcement Learning

## Miscellaneous

- **Ranked in top 100** among 200k candidates in the Graduate Aptitude Test in Engineering (Mechanical Engineering Division) in the year 2014. This is a highly competitive national level mathematics and technical aptitude test held by India's top tier universities for graduate studies.
- **Ranked 12th** in the Engineering Sciences in the National Eligibility Test for Junior Research Fellow in the year 2013. The test is held by the Council of Scientific and Industrial Research, India for research scholarship.

## Publications

- 2023 **S Shetty**, T Xue, and S Calinon, "Generalized Policy Iteration using Tensor Approximation for Hybrid Control", International Conference on Learning Representations (ICLR-2024).  
**[Spotlight Paper, 5% acceptance rate]**
- 2023 T Xue\*, **S Shetty\***, and S Calinon, "Dynamic Programming using Tensor Approximation for Contact-rich Manipulation", Workshop on Embracing Contacts, IEEE ICRA.
- 2023 **S Shetty**, T Lemobono, T Loew, and S Calinon, "Tensor Train for Global Optimization Problems in Robotics", The International Journal of Robotics Research (IJRR).
- 2021 **S Shetty**, J Silverio, and S Calinon, "Ergodic Exploration Using Tensor Train: Applications in Insertion Tasks", in *IEEE Transactions on Robotics*.  
**[Awarded Idiap's Paper of the year 2021 by Idiap Research Institute, Switzerland]**
- 2021 L Bruder Müller, T Lembono, **S Shetty**, S Calinon, "Trajectory Prediction with Compressed 3D Environment Representation using Tensor Train Decomposition", in *Proc. IEEE Intl Conf. on Advanced Robotics (ICAR)*.
- 2019 S Kolathaya, A Joglekar, **S Shetty**, D Dholakiya, A Sagi, S Bhattacharya, A Singla, S Bhatnagar, A Ghosal, B Amrutur, "Trajectory based deep policy search for quadrupedal walking", in *28th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)*.
- 2019 **S Shetty**, A Ghosal, "Trajectory Tracking and Control of Car-Like Robots", in *Machines, Mechanism and Robotics, Lecture Notes in Mechanical Engineering. Springer, Singapore*.