Sai Krishna **Gottipati**

MACHINE LEARNING · REINFORCEMENT LEARNING · DRUG DISCOVERY · ROBOTICS

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Education

Mila, University of Montreal — *Montreal, Canada*

MASTERS (RESEARCH) IN ARTIFICIAL INTELLIGENCE — *Sep 2017 - Aug 2019*

- CGPA: 3.9/4.0; Thesis on Deep Active Localization, supervised by Prof. Liam Paull
- Relevant Courses: Deep Learning Theory (A+), Reinforcement Learning (A+), Probabilistic Graphical Models (A)
- Research Projects: Maplite, Actor Critic inspired GANs for modelling temporal data distributions, Analyzing disentanglement in variational auto encoder, Neural SLAM, Deep pepper - a chess engine.

International Institute of Information Technology — *Hyderabad, India*

BACHELOR OF ENGINEERING IN ELECTRONICS AND COMMUNICATION WITH HONOURS IN ROBOTICS — *Aug. 2013 - May 2017*

- CGPA: 8.64/10.00; ranked 2nd in class
- Relevant Courses: Computer Vision (A), Digital Image Processing (A), Mobile Robotics(A), Science-2 (A)
- Research Projects: Reconstructing Vehicles from a single image: shape priors for road scene understanding, The Mahindra rise autonomous car challenge, Efficient object proposals, Square piece jigsaw puzzle solver

Experience

99andBeyond — *Montreal, Canada*

FOUNDING RESEARCHER / LEAD ML RESEARCHER — *Sep 2019 - Present*

- Led a team of 11 researchers from 8 institutions to develop the world's first chemical reaction based molecule generation system using reinforcement learning that solved the long standing challenge of synthesizability in drug design (patent pending).
- Introduced and developed three novel RL algorithms that handled the long standing challenges of large discrete action space, multiple action types, and optimizing for the maximum reward objective.
- Leading several ongoing efforts on developing novel machine learning and reinforcement learning algorithms for drug discovery and producing in-vitro proof of concept, in collaboration with a national laboratory and leading academic institutes.

Publications

[ICML 2020] Learning To Navigate The Synthetically Accessible Chemical Space Using Reinforcement Learning: Sai Krishna Gottipati, Boris Sattarov, Sufeng Niu, Yashaswi Pathak, Haoran Wei, Shengchao Liu, Karam M. J. Thomas, Simon Blackburn, Connor W. Coley, Jian Tang, Sarath Chandar, Yoshua Bengio. [paper] [code] [blog] [talk]

[NeurIPS 2020 Deep RL workshop spotlight talk, in review at ICLR 2021] Maximum Reward Formulation In Reinforcement Learning: Sai Krishna Gottipati, Yashaswi Pathak, Rohan Nuttall, Sahir, Ravi Chunduru, Ahmed Touati, Sriram Ganapathy, Matthew Taylor, Sarath Chandar. [paper] [code]

[AAAI 2021] TAC: Towered Actor Critic For Handling Multiple Action Types In Reinforcement Learning For Drug Discovery: Sai Krishna Gottipati, Yashaswi Pathak, Boris Sattarov, Sahir, Rohan Nuttall, Mohammed Amini, Matthew Taylor, Sarath Chandar

[ICRA 2020, RA-L: best paper award] MapLite: Autonomous Intersection Navigation Without a Detailed Prior Map: Teddy Ort, Krishna Murthy, Rohan Banerjee, Sai Krishna Gottipati, Dhaivat Bhatt, Igor Gilitschenski, Liam Paull, Daniela Rus. [paper] [thesis] [related media]

[RA-L 2019] Deep Active Localization: Sai Krishna Gottipati, Keehong Seo, Dhaivat Bhatt, Vincent Mai, Krishna Murthy, Liam Paull. [paper] [thesis] [code]

[ICRA 2017] Reconstructing vehicles from a single image: Shape priors for road scene understanding: Krishna Murthy, Sai Krishna Gottipati, Falak Chhaya, Madhava Krishna [paper] [code]

[arXiv 2018] Deep Pepper: Expert Iteration based Chess agent in the Reinforcement Learning Setting: Sai Krishna Gottipati, Kyle Goyette, Ahmad Chamseddine, Breandan Considine. [paper] [code]

Skills

Languages / Libraries Proficient in **python, pytorch**, C, C++, MATLAB, OpenCV, ROS