Gautham Vasan

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EDUCATION

UNIVERSITY OF ALBERTA | M.Sc (Thesis) in Computing Science
Thesis Advisor: Dr. Patrick M. Pilarski | Sep 2017 | Edmonton, AB, Canada • Cum. GPA: 3.90/4.0
Courses: Reinforcement Learning in Artificial Intelligence | Intro to Machine Learning | Convolutional Neural Nets for Image Processing | Applications of Reinforcement Learning: Actor-Critic Algorithms | Medical Robotics

NATIONAL INSTITUTE OF TECHNOLOGY (NIT), TIRUCHIRAPPALLI | B.Tech in Instrumentation and Control Engineering
Thesis Advisor: Dr. V. Sankaranarayanan | First Class | May 2015 | Tiruchirappalli, TN, India • Cum. GPA: 8.40/10.0
Courses: Data Structures and Algorithms | Linear Algebra & Probability Theory | Modern Control Theory | Digital Signal Processing | Product Design | Biomedical Instrumentation

EXPERIENCE

ARTIFICIAL INTELLIGENCE ENGINEER | Kindred Systems Inc
Artificial General Intelligence, Machine Learning and Robotics research | Toronto, Canada | Sep 2017 to Present

- Developing fundamental principles of intelligence and designs of general-purpose artificial minds.
- Deep Learning and Reinforcement Learning research and their applications for real-world robot control tasks.

RESEARCH ASSISTANT | BLINC and RLAI Lab
Labs headed by Dr. Patrick M. Pilarski and Dr. Richard S. Sutton, University of Alberta | May 2016 to Aug 2017

- The goal of our work was to create intelligent artificial limbs to extend abilities for people with amputations. We wanted to develop prosthetic devices that understand, anticipate the needs of an amputee, taking suitable actions to assist the user.
- Using Actor-Critic Reinforcement Learning (ACRL), we developed methods that would allow an amputee to use their non-amputated arm to teach their prosthetic arm how to move through a wide range of coordinated motions and grasp patterns. We presented our results from 3 able-bodied subjects and 1 trans-radial amputee.
- We used camera data and additional sensors on a prosthesis to provide contextual information in order to allow an ACRL system to produce varied motor synergies in response to similar electromyography (EMG) signals from the user.
- Ongoing medical study to assess functional gain with the use of assistive robots in patients affected by stroke, spasticity or cerebral palsy. I was responsible for analyzing the recorded data and setting up the robot infrastructure for 12 patients.

TEACHING ASSISTANT | CMPUT 174: Introduction to the Foundations of Computation I
Instructors: Dr. Duane Szafron, Dr. Sadaf Ahmed and Dr. Jorg Sander, University of Alberta | Sept 2015 to April 2016

- A problem-based intro to computing science to focus on expressing problems precisely, solving them algorithmically by showing how to construct a solution, and then implementing that solution by writing a program using python.

ACHIEVEMENTS

- Winner of the 2017 **M.Sc Outstanding Thesis Award** in Computing Science at the University of Alberta.
- **Attended the 2017 edition of the Deep Learning Summer School** organized by Dr. Graham Taylor, Dr. Aaron Courville and Dr. Yoshua Bengio at the **University of Montreal** , Canada.
- Selected among top 1000 students from 25+ countries to participate in Hack the North 2016, Canada's biggest hackathon at the University of Waterloo.
- **Phase - 1 Winners and Finalist** at the **Texas Instruments Innovation Challenge India Design Contest - 2014** for our project titles 'A Control Strategy for an Autonomous Robotic Vacuum Cleaner for Solar Panels'.
- Certificates of distinction in International and National Math, Science and Cyber Olympiads.

LANGUAGES

Most familiar:
C • C++ • Python • ROS • Matlab • Tensorflow • Keras

Over 1000 lines:
Embedded C • Octave • Assembly • Theano

PUBLICATIONS

- Gautham Vasan, Patrick M. Pilarski, **Context-Aware Learning from Demonstration: Using Camera Data to Support the Synergistic Control of a Multi-Joint Prosthetic Arm** , 7th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob), August 26-29, Enschede, The Netherlands, 2018. 8 pages.

- Gautham Vasan, Examining Committee: Patrick M. Pilarski, Martha White and K Ming Chan, **Teaching a Powered Prosthetic Arm with an Intact Arm Using Reinforcement Learning** , M.Sc Thesis, University of Alberta, Edmonton, AB, Canada, Aug 29th, 2017.

  [Highlights] - Won the M.Sc Outstanding Thesis Award.

- Gautham Vasan, Patrick M. Pilarski, **Learning from Demonstration: Teaching a Myoelectric Prosthesis with an Intact Limb via Reinforcement Learning** , Proc. of the 2017 IEEE International Conference on Rehabilitation Robotics (ICORR). London, United Kingdom, 2017.

  [Highlights] - Selected among the top 29 out of 257 accepted papers for oral presentation.

- Gautham Vasan, Patrick M. Pilarski, **Mirrored Bilateral Training of a Myoelectric Prosthesis with a Non-Amputated Arm via Actor-Critic Reinforcement Learning** , 2017 Multi-disciplinary Conference on Reinforcement Learning and Decision Making, Ann Arbor, MI, United States, 2017.

  [Highlights] - Selected among the top 16 out of 200+ accepted papers for oral presentation.

- Craig Sherstan, Marlos C. Machado, Jaden Travnik, Adam White, Gautham Vasan, Patrick M. Pilarski, **Confident Decision Making with General Value Functions** , 2017 Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM). Ann Arbor, MI, United States, 2017.

- Kenny Young, Gautham Vasan, Ryan Hayward, **NeuroHex: A Deep Q-learning Hex Agent** , Computer Games Workshop at IJCAI 2016, New York City, NY, USA, July 9th, 2016.

- Juhi Ajmera, Siddharthan P Rajasekaran, Ramaravind K. M., Gautham Vasan, Naresh Balaji Ravichandran and V. Sankaranarayanan, **Autonomous visual tracking and landing of a quadrotor on a moving platform** , 2015 Third International Conference on Image Information Processing (ICIIP), Waknaghat, 2015, pp. 342-347.

- Gautham Vasan, Naresh Balaji Ravichandran, Gowtham Kumar T.S.B, Aravind Govindan, G Saravana Ilango **A Control Strategy for an Autonomous Robotic Vacuum Cleaner for Solar Panels** , Texas Instruments India Educators Conference, IEEE Xplore, Bangalore, India, April 4th, 2014.

POSTERS & INVITED TALKS

- **Learning from Demonstration: Teaching a Myoelectric Prosthesis using an intact Limb via Reinforcement Learning** , Cognition Seminar, Dept. of Psychology, University of Alberta, Feb 3, 2017.

- **Mirrored Bilateral Training of a Myoelectric Prosthesis with a Non-Amputated Arm via Reinforcement Learning** , Prairie Perception Action and Cognition Team (P-PACT), Canmore, Alberta, Canada. November 5, 2016.

- **Learning from Demonstration: Teaching a Myoelectric Prosthesis using an intact Limb** , Glenrose Spotlight on Research Breakfast (SoRB), Edmonton, AB, Canada, Oct 20, 2017.

LEADERSHIP EXPERIENCE

- **Treasurer** , Computing Science Graduate Students' Association (CSGSA) at the University of Alberta (04/2016 - 04/2017).
- **Head of Treasury, Festember'14** the annual International cultural festival of NIT Trichy.
  I handled the finances of the festival worth INR 20 Million and executed several key decisions with regards to budget, expenditure, resource management for teams, etc.
- **Researcher at Spider** , The official R&D club of NIT Trichy - We conducted tech talks and workshops focusing on microcontrollers and embedded programming.