Gautham Vasan

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EDUCATION

UNIVERSITY OF ALBERTA | M.Sc (Thesis) in Computing Science

Expected Aug 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

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

RESEARCH

LEARNING FROM DEMONSTRATION: TEACHING A MYOELECTRIC PROSTHESIS USING AN INTACT LIMB | Advisor: Dr. Patrick M. Pilarski, University of Alberta

May 2016 – Present | Edmonton, AB

- Using actor-critic reinforcement learning, we're working on 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're using camera data and additional sensors on a prosthesis to provide enough contextual information to allow an ACRL system to produce varied motor synergies in response to similar EMG signals from the user.

GAIN OF FUNCTION WITH UPPER-EXTREMITY ASSISTIVE ROBOTS IN PATIENTS WITH SPASTICITY | Collaborators: Dr. K. Ming Chan, Dr. Patrick M. Pilarski, University of Alberta

Sept 2016 – Present | Edmonton, AB

- We are investigating the use of upper extremity prosthesis in patients with impaired motor function.
- We first determine whether the signals from forearm muscles are adequate to control a myoelectric prosthesis. We will then assess functional gain with the use of this device as a possible future treatment endeavour.

DEEP REINFORCEMENT LEARNING FOR HEX | Advisors: Dr. Nilanjan Ray, Dr. Ryan Hayward, University of Alberta

March 2016 – May 2016 | Edmonton, AB

- Hex is a strategy board game played on a hexagonal grid, theoretically of any size and several possible shapes
- The model is a convolutional neural network, trained with a variant of Q-learning, whose input is player positions and edge connections and whose output is a value function estimating future rewards.

EXPERIENCE

RESEARCH ASSISTANT | Working jointly with the BLINC and RLAI Lab

Labs headed by Dr. Patrick M. Pilarski and Dr. Richard S. Sutton, University of Alberta | May 2016 to Present

- The goal of our work is to create intelligent artificial limbs to extend abilities for people with amputations. We want to develop prosthetic devices that understand, anticipate the needs of an amputee, taking suitable actions to assist the user.

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

LANGUAGES

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

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

ACHIEVEMENTS

- Phase - 1 Winners and Finalist at the Texas Instruments Innovation Challenge India Analog Design Contest - 2014 for the project titled 'A Control Strategy for an Autonomous Robotic Vacuum Cleaner for Solar Panels'.

- Certificates of distinction in International and National Math, Science and Cyber Olympiads.

PUBLICATIONS

- Gautham Vasan, Patrick M. Pilarski, MIRRORED BILATERAL TRAINING OF A MYOELECTRIC PROSTHESIS WITH A NON-AMPUTATED ARM VIA ACTOR-CRITIC REINFORCEMENT LEARNING , Under review for the 2017 Multi-disciplinary Conference on Reinforcement Learning and Decision Making. Ann Arbor, MI, United States, 2017.

- Gautham Vasan, Patrick M. Pilarski, LEARNING FROM DEMONSTRATION: TEACHING A MYOELECTRIC PROSTHESIS WITH AN INTACT LIMB VIA REINFORCEMENT LEARNING , Under review for the Proc. of the 2017 IEEE International Conference on Rehabilitation Robotics (ICORR). London, United Kingdom, 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

- Gautham Vasan, Naresh Balaji R, Gowtham Kumar T.S.B, Aravind Govindan, 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 - present).

- 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.