

Sriram Ganapathi Subramanian

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EDUCATION

University of Waterloo, Waterloo, Ontario, Canada

- MASC. in Electrical and Computer Engineering Sep 2016 – Apr 2018
 - Research Area: Pattern Analysis and Machine Intelligence
 - Research Thesis: “Reinforcement Learning for Determining Spread Dynamics of Spatially Spreading Processes with Emphasis on Forest Fires”
 - Adviser: Dr. Mark Crowley, Assistant Professor, Department of Electrical and Computer Engineering, University of Waterloo.
 - Focus: Reinforcement Learning, Deep Learning, Image Processing, Software Engineering and Algorithms.

College Of Engineering Guindy, Anna University, Chennai, Tamil Nadu, India

- Bachelor of Engineering in Geo Informatics Jul 2012 – Jul 2016
 - Graduated with Honors and first rank.
 - Cumulative GPA: 9.7 / 10.00
 - Research Thesis: “Cartographic View of Cancer”
 - Advisor: Dr. S. Jayalakshmi, Assistant Professor, Department of Remote Sensing, Anna University.

RESEARCH EXPERIENCE

Borealis AI, Edmonton, Canada

May 2018 – Aug 2018

- Research Intern - Machine Learning
 - Project: Stock Market Trading using Reinforcement learning. I am tasked with creating a Reinforcement Learning (RL) Model for the stock market scenario, implement and test a number of state of the art RL algorithms and design a novel algorithm for this context.
 - Applied Research Team.
 - Supervisor: Nidhi Hegde, Applied Research Team Lead, Borealis AI, Edmonton.
 - Focus: Reinforcement Learning

Machine Learning Lab, University Of Waterloo

Sep 2016 – Apr 2018

- Master’s Student, Electrical and Computer Engineering Department
 - Project: Reinforcement Learning for Determining Spread Dynamics of Spatially Spreading Processes with emphasis on forest fires
 - Supervisor: Prof. Mark Crowley, Assistant Professor, University of Waterloo
 - Focus: Spatially Spreading Processes (SSP), Forest Fire Management, Deep Learning, Reinforcement Learning, Statistical Analysis, Data Analytics.

Predictive Collaborative Automated Drive for Crash Avoidance, Research Assistant, Denso International America, Detroit, Michigan and University of Waterloo

Apr 2017 – Jan 2018

- This project involves enabling an ensemble of self driving cars to learn predictive collaborative driving alongside human driven cars for navigation and crash avoidance. My role in the project involved using Reinforcement Learning algorithms like Deep Q learning to make the learning modules for the vehicles. The project was showcased as a demonstrative display at the Consumer Electronics Show (CES) -2018 in Las Vegas (from 8th January to 12th January.)
- Supervisors: Prof. Sebastian Fischmeister, Associate Professor, University of Waterloo
Prof. William Melek, Professor, University of Waterloo
Prof. Mark Crowley, Assistant Professor, University of Waterloo
- Focus: Reinforcement Learning, Autonomous Driving on multilevel dynamic system.

Spatial Pattern Comparison Statistics, Research assistant, Wilfrid Laurier University, Waterloo, Ontario, Canada.

May 2017 – Aug 2017

- This project involves the research and development of various, recent spatial pattern comparison statistics methods as a package in R. My role was concerned with implementing the package and reproducing results from the corresponding research publications.
- Supervisor: Prof. Colin Robertson, Associate Professor, Wilfrid Laurier University
- Focus: Spatial Statistics, Pattern Comparison, R Library Implementation, Geo-computation.

Geo+Social Analytics for Healthy Urban Environments, Research Intern, Wilfrid Laurier University, Waterloo, Ontario, Canada.

Apr 2015 – Aug 2015

- This project involves finding important influences of the spatial environment a person interacts with, on his/her mental health. My role comprised of implementing the computational tools and statistical functions needed in the project as an API. C++ was used as the language of development. Additionally, I also worked on developing visualization modules to represent the derived results.
- Supervisor: Prof. Colin Robertson, Associate Professor, Wilfrid Laurier University
- Mitacs Graduate Fellowship
- Focus: Metal Stress, Geographic modelling , GIS , Geo-computation.

TEACHING EXPERIENCE

Algorithms and Data Structures, Teaching Assistant, University Of Waterloo Jan 2017 – Apr 2017

- My responsibilities included helping students with lab projects and grading assignments.
- Got a high TA grading of 4.64 on 5.

Data and Knowledge Modelling , Teaching Assistant, University Of Waterloo Jan 2018 – Apr 2018

- My responsibilities included preparing and grading homework, assignments and exam; guiding students with projects and providing assistance for theoretical understanding of the course material.

PUBLICATIONS

- [1] Sriram Ganapathi Subramanian, “Reinforcement Learning for Determining Spread Dynamics of Spatially Spreading Processes with Emphasis on Forest Fires” Masters Thesis, University of Waterloo, Apr 2018.
- [2] Sriram Ganapathi Subramanian and M. Crowley, “Using Spatial Reinforcement Learning to Build Forest Wildfire Dynamics Models from Satellite Images” *Journal of Frontiers in ICT - Environmental Informatics*. Apr 2018.
- [3] Sriram Ganapathi Subramanian and M. Crowley, “Combining MCTS and A3C for Prediction of Spatially Spreading Processes in Forest Wildfire Setting” in *31st Canadian Conference on Artificial Intelligence* , Toronto, ON, Canada, May 2018.
- [4] Sriram Ganapathi Subramanian, Benyamin Ghojogh, Jaspreet Singh Sambee and M. Crowley, “Decision Assist For Self-Driving Cars” in *31st Canadian Conference on Artificial Intelligence*, Toronto, ON, Canada, May 2018.
- [5] Sriram Ganapathi Subramanian and M. Crowley, “Learning Forest Wildfire Dynamics from Satellite Images using Reinforcement Learning” in *Conference on Reinforcement Learning and Decision Making*, Ann Arbor, MI, USA, Jun 2017.
- [6] Sriram Ganapathi Subramanian and Ranjit.C.J “Cartographic View of Cancer” Bachelors Thesis, Anna University Apr 2016.
- [7] Sriram Ganapathi Subramanian and Amrith Ganesh, “Spatial Decision Support System for Industrial Robots.” in *International Conference on Innovations in Marine Electrical and Electronics Engineering*, Chennai, Tamil Nadu, India, Apr 2015
- [8] Sriram Ganapathi Subramanian, Alwish Ranjith and Ramji Vaidyanathan, “Farmer’s Friend - A Compact and Easy to use Agricultural Device” Under Review in *Computers and Electronics in Agriculture*, Elsevier, Submitted on Apr 2018

PRESENTATIONS

- [1] Sriram Ganapathi Subramanian “Reinforcement Learning for Determining Spread Dynamics of Spatially Spreading Processes with Emphasis on Forest Fires”, Master’s Seminar in *University of Waterloo*, on 3rd Apr 2018
- [2] Sriram Ganapathi Subramanian “Reinforcement Learning in SSP and Autonomous Driving domains”, in *Borealis AI, MaRS Heritage Building, 101 College St, Suite 350, Toronto, ON*, on 26th Mar 2018
- [3] Sriram Ganapathi Subramanian “Learning Forest Wildfire Dynamics from Satellite Images Using Reinforcement Learning ”, in *Conference of Reinforcement Learning and Decision Making, University of Michigan, Ann Arbor, MI, USA*, on 12th Jun 2018

PATENTS

- [1] Sriram Ganapathi Subramanian, Keshav Pameshwaran, Sivakumar.S, Patent Number: 11581/2015-CO/L, “Mine closure using remote sensing aid”, Pending Indian Patent, Feb 2016.

AWARDS & SCHOLARSHIPS

- AI for Earth Microsoft Azure Grant May 2018
Azure Credits of 15000 USD awarded for Master’s Thesis project.
- Mitacs Graduate Fellowship May 2016

- A 15000 CAD scholarship for Research Masters in Canada.
- Faculty of Engineering Award, ECE dept, University of Waterloo. May 2017
Sum of 3000 CAD for outstanding academic performance in the fall 2016 and winter 2017 terms.
- Governor's Medal, Anna University Aug 2015
For Graduating at the top of the Geoinformatics Batch, 2012-2016, Anna University, Chennai.
- Vice-Chancellors Award for academic merit - Merit certificate, Anna University. Aug 2015
For attaining a semester GPA of 10.
- Best Outgoing Student, Geoinformatics Department, College of Engineering Guindy Jul 2016
For outstanding performance in the undergraduate program.
- Mitacs Global Link Research Award May 2015
Fully funded internship of 3 months in Canada.
- Mapp your way Jan 2016
Environmental Systems Research Institute (ESRI)
Application built for Bio war and Disease Outbreak - Rated the second best application in national level
- Hackathon - HackforHealth Jan 2017
Awarded 1st place for Eye talk mobile application targeting patients suffering from speech defects and Alzheimer's disease.
- Hackathon - EngHacks Mar 2017
Awarded 3rd place for Mental Stress identification web application based on Waterloo open data portal.

PROFESSIONAL AFFILIATIONS & ACTIVITIES

- **Indian Society of Geomatics,**
Space Application Centre, Ahmadabad, India
Member 2016 – Present
- **Indian Society of Remote Sensing,**
Dehradun, Utrakhand, India
Member 2016 – Present

CAMPUS ACTIVITIES

- **Tech Forum,** College of Engineering Guindy, Anna University Aug 2016 – Aug 2017
Student Director of Projects
Responsibilities included:
 - Guiding student projects on campus
 - Run the UNESCO patronaged technical event of College of Engineering Guindy, called Kurukshetra.
- **Expectations Workshop,** University of Waterloo. Apr 2018
Student Mentor
Responsibilities included:
 - Instructing future Teaching Assistants on the rules and responsibilities of the same in University of Waterloo.
 - Organizing workshop activities for training students to take up Teaching Assistant roles.

LANGUAGES

- Tamil: Native language.
- English: Fluent (speaking, reading, writing).
- Hindi: Intermediate (reading); basic (speaking, writing).
- Sanskrit: Intermediate (reading); basic (speaking, writing).

SKILLS

Deep Learning frameworks (Tensorflow, Torch), Web Development, GIS (Arc GIS and QGIS), Image Processing(ERDAS, Opticks), R, C++, C#, Java, Python, SQL, Video Editing, Game Development, \LaTeX

INTERESTS

Mirudangam (South Indian Percussion Instrument), Cricket, Swimming.

REFERENCES

- **Dr Mark Crowley**
Assistant Professor, Electrical And Computer Engineering
University of Waterloo
200 University Ave W, Waterloo, ON , Canada
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- **Dr Sebastian Fischmeister**

Associate Professor, Department of Electrical and Computer Engineering
University of Waterloo
200 University Ave W, Waterloo, ON , Canada
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- **Dr SS Ramakrishnan**

Professor & Director, Institute of Remote Sensing
College Of Engineering Guindy
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