Nishanth Anand

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NishanthVAnand

Education

2019-Present **Ph.D. in Computer Science**, *McGill University, Montreal, Canada*, CGPA: **4.0/4.0**.

2017-2019 **M.Sc. in Computer Science**, *McGill University, Montreal, Canada*, CGPA: **3.92/4.0**.

2011-2015 **B.E. in Telecommunications Engineering**, *PESIT (now PES University), Bengaluru, India*, CGPA: **9.0/10.0**.

Publications

[Under Review] **Nishanth Anand**, Doina Precup, *Permanent and Transient Memories for Tracking in Continual Reinforcement Learning.*

ICML 2021 **Nishanth Anand**, Doina Precup, *Preferential Temporal Difference Learning*. [PDF]

2019 **Nishanth Anand**, *Temporal Credit Assignment via Traces in RL, M.Sc. thesis*. [PDF]

RLDM 2019 Pierre Thodoroff*, **Nishanth Anand***, Lucas-Page Caccia, Doina Precup, Joelle Pineau, *Recurrent Value Functions*. [PDF] (Also accepted at SPiRL workshop, ICLR 2019).

ADCOM 2016 HS Karthik, **Nishanth Anand**, J. Manikandan, *Stock Market Prediction using Optimum Threshold based Relevance Vector Machines.*

INDICON 2015 **Nishanth Anand**, J. Manikandan, *Sparse representation using optimum threshold based relevance vector machine.* [PDF]

INDICON 2015 **Nishanth Anand**, J. Manikandan, *SAR image compression using Relevance Vector Machines.* [PDF]

Academic Research Experience

Sept 2019 -Present **Ph.D. Thesis**, *McGill University and Mila*, Montreal, Canada.
- Advised by Prof. Doina Precup.
- Developed Preferential Temporal Difference Learning, a method to estimate value function efficiently in the presence of state preferences and partial observability.
- Inspired by Complementary Learning Systems (CLS) Theory, I am researching and developing a novel value-based method for continual reinforcement learning.

Jan 2018 - Aug 2019 **Master's Thesis**, *McGill University and Mila*, Montreal, Canada.
- Developed Recurrent Learning for Reinforcement Learning - a novel deep reinforcement learning method to compute value function efficiently.
- Unified various eligibility traces in reinforcement learning as Infinite Impulse Response (IIR) filters and demonstrated its advantages empirically.

Sept 2013 - May 2015 **Bachelor's degree project**, *CORI lab and PES University*, Bengaluru, India.
- Introduced an optimum threshold based pruning for relevance vector machines and applied it on image data.

Industry Experience

July 2015 - June 2017 **Data Scientist**, *Fractal Analytics*, Bengaluru, India.
- Adapted several techniques in AI and ML to solve client's business problems.
- Successfully completed several proof-of-concept projects and applied the solution methods on the real world problems.

Selected Projects

Feb 2020 - April 2020 **Matrix Splitting Methods for Prediction in RL**, *Course project*, Excursions in Reinforcement Learning.
- Developed sample-based counterparts of Gauss-Seidel, Successive Over-Relaxation, and Richardson's matrix splitting methods.
- Some of these methods had better empirical properties compared to temporal difference learning.

Feb 2019 - April 2020 **IIR Filters as a General Framework for Eligibility Traces**, *Course project*, Deep Learning Theory.
- Generalized several versions of eligibility traces in reinforcement learning using the IIR filters framework.
- Demonstrated the empirical benefits of this framework on toy tasks in the control setting.

Dec 2015 - April 2017 **Optimizing Campaign Management**, *Fractal Analytics*, Bengaluru, India.
- Developed a reinforcement learning based solution for a financial firm which assisted in targeted ad campaigning.
- With this technique, customers received personalized offers which increased the sales up to 10%.

Academic/Volunteering Activities

June-Dec 2023 **Co-organizer of the New in ML workshop, NeurIPS 2023**.
- I'm co-organizing New in ML workshop, a part of NeurIPS-2023 affinity workshops.
- My primary responsibilities include: drafting instructions for call for papers, drafting reviewing instructions, hosting and managing paper review system on Openreview.
- I'm also assisting with logistics on other aspects of the workshop like finding reviewers, finding speakers, drafting schedule for the workshop.

Nov 2022 - Aug 2023 **EDI Commissioner at McGill CS Graduate Society**, *McGill*, Montreal.
- As an elected executive I working towards improving equity, diversity, and inclusivity in the CS graduate school at McGill University by organizing Women in CS talks.
- I also coordinate with other executive team members to organize social and academic events at McGill's computer science department.

June-July 2019/2020 **Teaching Assistant at AI4Good Summer Lab**, *Mila*, Montreal.
- Assisted attendees (women and people of marginalized genders) on various topics in machine learning, deep learning, and reinforcement learning.
- Supervised a team of 3 students during the project phase.

2017-2020 **Teaching assistant at McGill University**.
- Introduction to Reinforcement Learning (Winter 2022, Winter 2020), Applied Machine Learning (Fall 2021), Introduction to Machine Learning (Fall 2018), Computers and Society (Winter 2021), Algorithms and Data Structures (Winter 2018), and Introduction to Operating Systems (Fall 2017)

May 2020 - present **Co-organizer of the RL sofa meetings**, *Mila*, Montreal.
- The RL sofa is a weekly meeting where a speaker presents their ongoing/finished work to the Mila RL community with the goal of receiving feedback on their project or to share their latest discovery.
- My main responsibilities include: finding speakers, making announcements, and moderating meetings.
- We have organized more than 100 meetings till date.

- **Other responsibilities**.
- Member of the Mila mental health committee, and actively volunteering to help in organizing several one-time events at Mila.
- Served as paper reviewers at various conferences and workshops (CoLLAs, NeurIPS)

Talks

March 2022 *TD(λ), eligibility traces and DRL*, Deep RL reading group, Mila.

July 2020 *TD(λ) Convergence Proof with Function Approximation*, RL theory reading group, Mila.

July 2020 *Q-learning and Deep Q-learning*, Lecture, AI for good summer school.

June 2020 *Preferential Temporal Difference Learning*, RL sofa meeting, Mila.

April 2020 *Introduction to Deep Reinforcement Learning*, Guest Lecture, PES University.

Jan 2020	*Dynamic Programming in Reinforcement Learning*, Lecture, COMP-767, McGill University.
Nov 2019	*Additive Approach to Lambda Returns*, RL sofa meeting, Mila.
Oct 2019	*Meta Gradient Reinforcement Learning*, RL theory reading group, Mila.
May 2019	*Advances in Deep Reinforcement Learning*, Lecture, MMA, McGill University.
March 2019	*Recurrent Value Functions*, RL sofa meeting, Mila.

Skills

Python, R, C, Pytorch, Numpy, Scikit-Learn, Pandas, Comet ML, LaTex, Slurm, Linux, Git.

Relevant Coursework

Graduate	Reinforcement Learning, Excursions in Reinforcement Learning, Machine Learning, Probabilistic Graphical Models, Mathematical Foundations for Machine Learning, Theoretical Principles of Deep Learning, Probabilistic Analysis of Algorithms, Matrix Computation.
Undergrad (selected)	Data Structures, Information theory, Signals and Systems, Micro Controllers, Control Systems, Linear Algebra, Calculus, Probability.

Honors and Awards

2019 -	Graduate award to pursue Ph.D., McGill University.
2018-2019	Graduate award to pursue M.Sc., McGill University.
2012-2015	Recipient of MHRD scholarship for excellent academic performance.
2011-2015	Recipient of distinction award in all the 8 terms during undergraduate studies.