Anand A R | Curriculum Vitae

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anand1812

I am a Data Scientist at Flipkart interested in pursuing AI research. Research interests lie in applied deep learning, computational biology, and reinforcement learning.

Education

- **Indian Institute of Technology Madras, Chennai** **2020**
  *Interdisciplinary Dual Degree with B.Tech in Biological Engg. and M.Tech in **Data Science***
  CGPA: 9.36/10
- **Velammal Matriculation Higher Secondary School, Chennai** **2015**
  XII (Matriculation), 1184/1200 (98.67%)
  Math - 100%, Physics - 99.5%, Computer Science - 99.5%
- **St. Moses Matriculation School, Chennai** **2013**
  X (Matriculation), 491/500 (98.2%), School Topper

Technical Skills

- **Machine Learning Libraries :** Tensorflow, Pytorch, scikit-learn
- **Programming Languages :** Python, C, C++, Octave, MATLAB, R

Research Experience

- **Okinawa Institute of Science and Technology** **May 2019 - July 2019**
  Research Intern *Onna, Japan*
  Guide : Dr. Kenji Doya
  - Evaluated the performance of model free RL algorithms on POMDPs using different RNN based approaches.
  - Implemented and benchmarked, a novel model free Reinforcement Learning algorithm that outperforms the existing state of the art methods in sample efficiency.
- **Purdue University** **May 2018 - July 2018**
  Research Intern *West Lafayette, USA*
  Guide : Dr. Gaurav Chopra
  - Modelled IR and MS spectra of compounds using ML/DL architectures to predict their chemical properties.
  - Visualized the information learnt by the model using guided backpropagation to understand chemical significance.
  - Achieved 0.85 average F1-score on all functional groups with highest on aldehydes (0.96) and lowest on amino acids (0.60).

Professional Experience

- **Xcode Life Sciences** **May 2017 - July 2017**
  Data Analytics Intern *Chennai, India*
  - Statistical tests on population data to find statistically significant correlation between SNP variants and phenotype.
  - Applied unsupervised learning techniques on genetic sequence to know about a person's ancestry.
  - Health predisposition and trait prediction on gene data to understand about people who are genetically predisposed to certain conditions.
- **Flipkart Pvt Ltd.** **Aug 2020 - Present**
  Data Scientist *Chennai, India*
  - Creating automatic answer generation system using relevant information from multiple data sources of the product.
  - Building a text-to-text transformer pretrained on various tasks using self-supervised learning on inhouse data.

Notable Projects

- **Constrained molecule generation** **Aug 2019 - June 2020**
  Guides : Dr. Balaraman Ravindran and Dr. Karthik Raman *IIT Madras, Chennai, India*
  - Employed Monte Carlo Tree Search for generation of drug like small molecules with desired properties.
  - Outperformed state of the art techniques in step-wise generation of molecules in performance and time complexity.
- **Essential gene classification** **May 2018 - Dec 2019**
  Guide : Dr. Karthik Raman *IIT Madras, Chennai, India*
  - Applied deep learning techniques to classify the presence of essential genes in amino acid sequences.
  - Used the learnt model to answer questions about presence and absence of motifs in the context of biology.
  - Achieved an average F1 score of 0.4 and outperformed the current state of the art algorithm in 21/30 organisms.
- **Intelligent Ground Vehicle Competition** **Aug 2016 - Jun 2017**
  Software module *IIT Madras, Chennai, India*
  - Built an autonomous bot using ROS framework that guides through obstacles and finds its way to reach the goal.
  - Participated in Intelligent Ground Vehicle Competition(IGVC) held in Oakland University, Michigan, USA.
  - Qualified for the final round in the debut attempt and placed 14th overall out of 33 teams from all over the world.

Publication & Preprint

- **Anand A. Rajasekar***, Jonathan Fine*, Krupal P. Jethava and Gaurav Chopra. Spectral deep learning for prediction and prospective validation of functional groups. (**Chem. Sci. Pick of the Week**, Chemical Science 2020).
- **Anand A. Rajasekar**, Karthik Raman and Balaraman Ravindran. Goal directed Molecule generation using Monte Carlo Tree Search. (Preprint).

Relevant Coursework

- Machine Learning (S: 10/10)
- Reinforcement Learning (A: 9/10)
- Mathematical Foundations of Data Science (S: 10/10)
- Data Analytics Laboratory (A: 9/10)
- Programming and Data structures lab (S: 10/10)
- Deep Learning (S: 10/10)
- Causal Inference (S: 10/10)
- Introduction to Data Analytics (S: 10/10)
- Big Data Laboratory (A: 9/10)
- Introduction to Programming (A: 9/10)

Academic Achievements

- Awarded **Institute Merit Prize** for the highest CGPA in Biotechnology dept. during 57^{th} convocation of IIT Madras
- Awarded **Biocon Prize** for the highest CGPA in Biological Engg. during 57^{th} convocation of IIT Madras.
- Ranked **10th out of 248** teams in Humanity RL Track at The 25th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (Aug 2019).
- Awarded **Honda Young Engineer and Scientist** award for excellence in engineering and science on 2018.
- Awarded **Ram Shriram Scholarship** for academic excellence on 2017 & 2018.
- **First place** in Manual Robotics conducted during TECHSOC 2016 (Inter hostel tech competition) & SHAASTRA 2017.

Positions of Responsibility

- **Teaching Assistant** for Life Sciences, core course offered by Biotechnology dept. of IIT Madras (Aug - Dec, 2019)
- **Teaching Assistant** for Reinforcement Learning, graduate course offered by Computer Science dept. of IIT Madras (Jan - May, 2020)
- Selected as a **mentor** for Data science specialization (Aug – Nov, 2017) in python by Coursera based on the course performance