Saurabh Daptardar

Graduate student · Rice University
1515 Bissonnet Street, Apt # 326B, Houston, TX - 77005
+1 (713)-834-4559 | svd3@rice.edu | svd3.github.io | svd3 | saurabh-daptardar

Research Interests

Reinforcement Learning, Deep Learning, Machine Learning, Graphical Models and Inference

Education

Rice University *Houston, TX*
M.S. in Electrical Engineering *Aug. 2016 - Present*
- Research Areas: Neuroscience and Data science
- Cumulative GPA: 3.90

Indian Institute of Technology, Madras *Chennai, India*
B.Tech in Electrical Engineering *Aug. 2010 - May 2014*
- CGPA: 8.77/10.0

Technical Skills

Programming Languages C, C++, Python, R, Matlab
Deep learning frameworks Tensorflow, PyTorch

Experience

Xaq Labs, Rice *Houston, TX*
Research Assistant *Nov. 2016 - Present*
- Working on the Firefly project: Understanding the control algorithms of the brain
- Implemented Iterative LQG algorithm to solve the firefly task.
- Working on POMDPs, Reinforcement Learning to solve similar tasks in much broader and general framework.
- Implemented DQN with experience replay to solve the firefly task.
- Developed OpenAI Gym environment with rendering for the firefly task.
- Working on Inverse Reinforcement Learning problem and graphical models to do inference on the assumed dynamics and latent variables of the brain

Samsung Research *Bengaluru, India*
Senior Software Engineer *Jul. 2014 - Aug. 2016*
- Worked on the Car Analytics Engine and Smart Glove Gestures project.
- Developed algorithms for the Samsung connect auto.
- Worked on user/driver profiling, context based dynamic fuel estimation modeling, maneuver detection, event detection, and gesture recognition based on IMU sensors.
- Published a paper in IEEE Sensors 2015, Busan Conference.
- Worked on high-dimensional clustering algorithm and statistical learning methods.

Undergraduate Research, Prof. Devendra Jalihal *IIT Madras, India*
Single Frame Image Super Resolution *Sep. 2013 - May. 2014*
- Implemented the kernel Hebbian algorithm for single frame image super resolution.
- Integrated algorithm into a web application for medical/agricultural advisory.
- Presented a paper poster on the idea at Indo-UK meet at Ipswich, UK.

Course Projects

Image Captioning with RNNs
- Implemented a single layer RNN (LSTM) model to caption images on COCO dataset.
- Working to train it on SVHN dataset to recognize numbers in images.

Decoding neural activity to estimate control target *Neural Signal Processing*
- Successfully decoded reach targets with the plan period and movement period signals from the dorsal pre-motor cortex.
- Implemented and reproduced the results in the paper "*Improving neural prosthetic system performance by combining plan and peri-movement activity*", Yu et. al.
- Wrote a code to convert data from Python compatible `.npz` format to R compatible `.rds` format and made it available for others.

Neural decoding: ECOG data to speech *Statistical Learning*

- Implemented few ensemble methods to classify the signals into limited dictionary of words.
- Identified few brain areas, and frequencies which were important for decoding.

PacWar *Artificial Intelligence*

- Goal of the project was to find the best possible gene sequence that defines an agent's behavior to win over most of other agents.
- Designed and implemented genetic evolutionary algorithm to find the best possible gene sequence.

Publications

[1] Saurabh Daptardar et al. "Hidden Markov Model based driving event detection and driver profiling from mobile inertial sensor data". In: *SENSORS, 2015 IEEE*. IEEE. 2015, pp. 1–4.

Honors & Awards

2016 **Fellowship**, Rice ECE Department Fellowship *Houston, TX*

note: links to the personal webpage/blog, github profile, linkedin profile and mail are embedded at the top of the first page