Sudeep Raja Putta

Contact Information

Xerox Research Centre India
Wing A, Etamin Block, Prestige Technology Park
Marathahalli, Bangalore-560103, India.

sudeepraja94@gmail.com
sudeepraja.github.io
+91-8515958481

Research Interests

Reinforcement Learning, Multi-Armed Bandits, Machine Learning Theory, Optimization

Education

Indian Institute of Technology, Kharagpur July 2012 to May 2016
Bachelor of Technology (Honors), Computer Science and Engineering
CGPA: 8.88/10.0

Work Experience

Xerox Research Center India, Bangalore June 2016 to present
Budding Scientist Mentors: Theja Tulabandhula, Ph.D and Arun Rajkumar, Ph.D
Machine Learning and Statistics group, Algorithms and Optimization group

Publications

1. **Sudeep Raja Putta**, Theja Tulabandhula "Pure Exploration in Episodic Fixed-Horizon Markov Decision Processes". *Extended Abstract at AAMAS 2017.*

Papers under Review

1. **Sudeep Raja Putta**, Theja Tulabandhula "Efficient Pure Exploration via Posterior Sampling". *Under Review at IJCAI 2017.*
2. **Sudeep Raja Putta**, Theja Tulabandhula "Efficient Reinforcement Learning via Initial Pure Exploration". *Under Review at RLDM 2017.*

Research Experience

Pure Exploration in Episodic Fixed-Horizon Markov Decision Processes
Research Project, Xerox Research Center India Sept 2016 to present

- Proposed an algorithm based on **PSRL** and **Pure Exploration Thompson Sampling** for Pure Exploration in episodic fixed horizon MDPs.
- Empirically showed that our algorithm achieves **Deep exploration** and requires fewer episodes to reach a fixed confidence level.
- Empirically showed that our algorithm achieves good posterior distributions within a fixed budget.

Simultaneous Euclidean Distance Matrix Completion and Point Set Recovery
Research Project, Xerox Research Center India Dec 2016 to Present

- Proposed an algorithm based on **Alternating Minimization** for Euclidean Distance Matrix Completion.
- The algorithm is simultaneously able to recover a point set embedded in a specified dimension.
- Our algorithm is also robust to noise in the distances and unlike previous approaches, does not require special initialization.

Memory based Function Approximation
Research Project, Xerox Research Center India July 2016 to Dec 2016

- Proposed **Q-value approximation** heuristics using **K-Nearest Neighbour** regression and **LRU** memory.
- Implemented dynamic nearest neighbour searching using R-trees.
- Investigated the dependence of the performance of the agent on the LRU memory size using environments in **OpenAI Gym**.

Human Activity Recognition in Temporally Untrimmed Videos

Bachelor's Thesis Project, IIT Kharagpur — July 2015 to April 2016

- Trained deep neural networks consisting of **convolutional layers** and **recurrent LSTM layers** for human activity recognition and detection in videos.
- Used a subset of the UCF-101 and Thumos'15 dataset to train and test the networks.
- Showed that using Dense optical flow images along with RGB frames gave higher accuracy than late fusion of optical flow and RGB features.

Ambulance Response Time Optimization

Research Project, IIT Kharagpur — Nov 2014 to Jan 2015

- Modelled the problem of Ambulance Facility location in a city as a **Facility Location problem**.
- Created a graph using traffic and accident data collected from on the city of Bangalore.
- Used a Tabu search heuristic to find a set of locations to position ambulances, in order to reduce response time.

Online Certification

Machine Learning Engineer Nanodegree, Udacity — June 2016

Capsotone Project : Human Activity Recognition Using Smartphones

Research Internships

Tracking Idea Evolution in Discussion Forums

Cognitive Solution Group, IBM Research Labs, Bangalore — May 2015 to July 2015

- Developed heuristics for identifying the Ideas proposed in a forum and for tracking their evolution in form of a tree using **Latent Dirichlet Allocation**.

Text Recognition using Bidirectional LSTMs

Centre for Visual Information Technology, IIIT Hyderabad — May 2014 to July 2014

- Trained **Bidirectional LSTM** neural networks with a **CTC** layer for recognizing words from raw images of Indian language scripts.

Awards

Winner of **Xerox Research Innovation Challenge 2015**

For the work done on **Ambulance Response Time Optimization**

Runners up at **Microsoft Code Fun Do 2015**

For developing the mobile app **Artify**, similar to Prisma

Technical Experience

Programming — Python, C++, C, Java

Packages — Numpy, Scipy, Scikit-learn, Keras, Cvxpy

Extra Curricular Activities

Blogging about mathematics, machine learning and algorithms

http://sudeepraja.github.io/blog/

Recent Posts:

- Thompson Sampling vs Pure Exploration Thompson Sampling
- Bayesian Inference and the bliss of Conjugate Priors
- Multi Armed Bandits and Exploration Strategies
- Die rolls and Concentration Inequalities
- A Derivation of Backpropagation in Matrix Form

Conducted a quiz on Computer Science for High Schoolers — 12 Nov 2016

St.Paul's High School, Himayatnagar, Hyderabad