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CONTACT INFORMATION
Xerox Research Centre India
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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

RESEARCH 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". *AAMAS 2017.*
2. **Sudeep Raja Putta**, Theja Tulabandhula "Efficient Reinforcement Learning via Initial Pure Exploration". *RLDM 2017.*

RESEARCH PROJECTS

Euclidean Distance Matrix Completion Has No Spurious Local Minima
Research Project, Xerox Research Center India Work in Progress
- Trying to prove that the Euclidean Distance Matrix Completion Problem(EDMCP) has a property similar to **Low Rank Matrix Completion** and **Matrix Sensing**.
- If proven, simple algorithms like SGD are guaranteed to find the Global Optimum as **all Local Minima are globally optimal**.

Pure Exploration in Episodic Fixed-Horizon Markov Decision Processes Work in Progress
Research Project, Xerox Research Center India
- 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 good posterior distributions within a fixed budget and can be useful in a setting termed **Reinforcement Learning with Practice**.

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 and 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.
- 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**.
- Used a Tabu search heuristic to find a set of locations to position ambulances, in order to reduce response time.

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.

Online Certification

Machine Learning Engineer Nanodegree, Udacity June 2016

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

Workshops Attended

Machine Learning Winter School at XRCI December 2015

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