Kshiteej Sheth

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INTERESTS

- Algorithm design, specifically for problems arising in online, stochastic, streaming and distributed settings.
- Theoretical aspects of Machine Learning and Data Science.

EDUCATION

M.Sc. in Computer Science Sept 2018 - Ongoing
Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland
Current GPA - 5.74/6

B.Tech. in Electrical Engineering, Minor in Computer Science Aug 2014 - June 2018
Indian Institute of Technology (IIT) Gandhinagar, India.
GPA - 9.14/10

RESEARCH PAPERS

- X. Jia, **K. Sheth** and O., Svensson, "Fair Colorful k-Center Clustering", *International Conference on Integer Programming and Combinatorial Optimization (IPCO) 2020*, pages 209-222, [paper]
- **K. Sheth**, D. Garg and A. Dasgupta, "Improved Linear Embeddings via Lagrange Duality", *Mach. Learn. 2019* Vol-108, Issue 4, pages 575-594,[paper].
- A. Mahabal, **K. Sheth**, F. Gieseke et. al., "Deep-Learnt classification of Light Curves", *Proc. of the IEEE Symposium series on Computational Intelligence (SSCI), Honolulu, Hawaii, November 2017*, [paper].

AWARDS AND ACHIEVEMENTS

- **EPFL IC MSc Research Scholars program** (Feb 2019 - Jan 2020).
- **California Institute of Technology SURF fellowship** (May - July 2017).
- **IIT Gandhinagar Dean's List** for meritorious academic performance for the Semesters 1-6 .

RESEARCH EXPERIENCE

Research Assistant Feb 2019 - Ongoing
Theory of Computation lab 2, EPFL, Switzerland.
Advisor - **Prof. Ola Svensson**

- Worked on improving the competitive ratio for the Matroid Prophet Secretary problem, a stochastic version of the classical Matroid Secretary problem.
- Worked on designing a constant factor approximation algorithm for the Red Blue k-center problem - a generalization of the classical k-center and the k-center with outliers which incorporates fairness constraints. Work published in *IPCO 2020*.
- Worked on designing truthful mechanisms with improved approximation factors for combinatorial auctions with bidders having submodular valuation functions.

Semester Project Sept 2018 - Jan 2019
Theory of Computation lab 2, EPFL, Switzerland.
Advisor - **Prof. Ola Svensson**
Designed an exact algorithm for precedence constrained scheduling with unit jobs on unrelated machines for inputs with bounded chain lengths.

Research Assistant Jan 2017 - June 2018
Indian Institute of Technology Gandhinagar, India
Advisor - **Prof. Anirban Dasgupta** and **Prof. Dinesh Garg**

- Developed an approximation algorithm for constructing data-dependant low dimensional embeddings for datasets to preserve pairwise distances between data-points. Used convex relaxations and convex optimization techniques. Work published in *Machine Learning 2019*.
- Developed a Subsampled Randomized Hadamard transform based sketching algorithm for pre-processing and uniformly sampling data-points from a given training set to speed up the constrained version of Lasso Regression.

INTERNSHIPS

Summer Research Intern May 2017 - July 2017
California Institute of Technology, Pasadena, USA.
Advisor - **Dr. Ashish Mahabal**

- Developed Deep Neural Networks and data processing pipelines for classifying time series data of periodic astronomical objects captured by the CRTS survey. Tools used were Keras+Python.
- Implemented provable algorithms for performing Non-Convex Robust PCA using Numpy to separate dynamic foregrounds and static backgrounds of data-points.
- Achieved higher classification accuracy compared to baseline algorithms such as Random Forests when trained on raw d ata-points. Improved the classification accuracy by 15% by training only on foregrounds and performing hyperparameter tuning. Work was presented in the oral session of *IEEE SSCI 2017*.

SKILLS

- **Languages** : C/C++, Scala, HTML5.
- **Scripting** : Python, MATLAB, Lua, Bash.
- **Libraries** : Numpy/Scipy, Torch, Tensorflow, Keras, OpenCV.
- **Tools and Environments** : Git, LaTeX, Android Studio, IPython Notebook.
- **Database technologies**: MySQL.