Setareh Taki

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Summary

- **Operations Research intern** at Norfolk Southern Corporation (Feb 2021 - May 2021)
- **Interest** in Research, Operations Research, Quantitative Research, and Data Science positions
- **Experience** in Python, Algorithm Design, Machine Learning, and Large-scale optimization
- **Work Authorization:** United States permanent resident (Green Card holder)

Education

University of Illinois at Urbana-Champaign (UIUC)   *May 2022*
PhD in Industrial Engineering   *GPA: 3.82/4.00*

Sharif University of Technology (SUT)   *Aug 2015*
MSc in Industrial Engineering   *GPA: 3.58/4.00, (16.85/20)*

Programming Skills

Python: *PyTorch, Numpy, SciPy, Matplotlib, Pandas, scikit-learn, spaCy, NLTK, Pyomo (Gurobi and CBC solvers)*
Other Languages: Python | R | MATLAB

Professional Experience

Operations Research Intern   *Atlanta, GA*
Norfolk Southern Corporation   *Feb 2021 - Present*

- (*Started Recently*) Working on developing algorithms for a large-scale optimization project on railroad operations.

Researcher - Fair Division (Algorithmic Game Theory)   *Urbana, IL*
University of Illinois at Urbana-Champaign (Adviser: Jugal Garg)   *Aug 2017 - Present*

- Developed efficient approximation algorithms to allocate a set of items to agents using maximin share as a measure of fairness.
- Developed the first strongly polynomial algorithm for the best known approximation factor for MMS allocations.
- Improved the best known approximate maximin share allocation existence result.

Researcher - Assortment Optimization (Revenue Management)   *Urbana, IL*
University of Illinois at Urbana-Champaign (Adviser: James Mario Davis) *Aug 2016 – Aug 2017*

- Design and analysis of algorithm to obtain a set of items to agents in order to maximize the revenue using well-known customer choice models
- Investigated evidence for the correctness of proposed algorithms in Python before proving them mathematically

Selected Projects

Machine Learning Course Project in Python - Object Detection in Images   *Fall 2020*

- Loaded the CIFAR10 dataset using torchvision and normalized and transformed the training set
- Visualized a randomly picked sample of the pre-processed data using Matplotlib
- Initialized a neural network using the Xavier method in PyTorch and defined a convolutional Neural Network (CNN), a cross-entropy loss function, and an SGD optimizer
- Trained the network, saved the model, and tested the network after normalizing and transforming the test set

Data Science Course Project in Jupyter Notebook - "Harry Potter and the Sorcerer's Stone"   *Fall 2019*

- Cleaned and tokenized the text of the book using regular expressions, spaCy, NLTK and converted the tokens into bigrams
- Extracted the characters of the book by analyzing the words(excluding stop-words) using three different methods: starting with a uppercase letter, two-name characters, and inbuilt functions in spaCy (the first two methods were significantly faster)
- Studied and visualized the development of the characters throughout the book (using NumPy and matplotlib libraries)

Integer Programming Course Project in Python - Routing and Scheduling   *Spring 2016*

- *Placing drop centers:* heuristically, optimized the location of 20 drop centers by minimizing the distance of the origin and the destination of the 100,000 packages from their closest drop center using greedy approach
- *Scheduling:* Scheduled the visit and departure time of each courier in order to maximize the number of delivered packages within the time horizon

Selected Coursework

- **Algorithm:** Algorithms, Approximation Algorithms, Algorithmic Game Theory
- **Optimization:** Combinatorial Optimization, Integer Programming, Pricing and Revenue Management
- **Data Science:** Programming for Data Science, Applied Machine Learning, Machine Learning
- **Statistics:** Probability and Statistics I & II, Stochastic Processes & Applications

Publications

- "On the PTAS for Maximin Shares in an Indivisible Mixed Manna" with Rucha Kulkarni and Ruta Mehta. Accepted in *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI 2021)*.
- "Approximating Maximin Shares with Mixed Manna" with Rucha Kulkarni and Ruta Mehta. arXiv preprint arXiv:2007.09133 (2020).
- "An Improved Approximation Algorithm for Maximin Shares" with Jugal Garg. In *Proceedings of the 21st ACM Conference on Economics and Computation (EC 2020)*.
- "Approximating Maximin Share Allocations" with Jugal Garg and Peter McGlaughlin. In 2nd *Symposium on Simplicity in Algorithms (SOSA 2019)*.

Teaching Experience

University of Illinois at Urbana-Champaign & Sharif University of Technology   *Spring 2014 – Present*
- Trained students formally and informally in different courses such as Analysis of Data, Integer Programming, Deterministic Models in Optimization, Analysis of Network Data, Supply Chain Management, and Foundation of Quality Systems.
- Evaluated the performance of the students and provided constructive feedback

References

Dr. Jugal Garg
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Dr. Ruta Mehta
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