TUGBA SERPIL SENSOY CELLAT

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Data science professional in Energy field with 4 years of experience executing data-driven solutions to tackle challenging problems. Deep understanding of statistical concepts and algorithm design as well as strong business acumen.

- Hands-on experience on machine learning methods, data visualization, clustering, classification, dimension reduction, regression, optimization methods, feature selection/extraction and statistical inference on sustainable energy area.
- Ability to work independently as well as in a team environment. Strong interpersonal skills to communicate effectively with interdisciplinary team members from different backgrounds and demonstrate data-driven results technical and non-technical colleagues in a clear manner.
- Proficient in statistical software package (Python, R, Matlab, SPSS, Minitab, SQL, Microsoft Office)

Professional Experience

Data Science Fellow, *FellowshipAI* *05/2020 – 09/2020 & 01/2021-05/2021*

- Built a framework to measure the effectiveness of email marketing for a top US fashion brand.
- Calculated several metrics for sales funnel flow such as delivery rates, open rates, click-through rate, bounce rate, revenue per email, click to purchase rate, cart to purchase rate etc.
- Developed various computer vision models (*e.g., C-GAN, VAE-GAN, Non-GAN, UNet, Resnet34) and* worked on data augmentation techniques to understand and improve image prediction of post-operational process.
- Worked on data collection, data cleaning, and classification of wound types.
- Improved classification accuracy of 7 wound types from 0.53 to 0.83.
- Built multi-armed bandit algorithm for website optimization.
- Presented results using visualization tools to deliver key insights to non-technical audience.

Research Scientist/Energy Analytics, *Florida State University* *01/2019 – 01/2021*

- Analyzed energy efficiency of solar collectors for different operational parameters and environments.
- Managed end-to-end model development process including data acquisition, cleaning, processing, model building, and model evaluation and interpretation.
- Built both statistical inference and modeling as well as machine learning algorithms and black box ML models such as *GBM* and *XGBoost* to predict energy efficiency for a given solar collector.

Graduate Assistant, *Florida State University* *08/2012 – 12/2018*

- Developed various statistical models (*e.g., multivariate regression- lasso &ridge, hypothesis testing, confidence intervals, statistical inference)* to understand key components of Parabolic Trough Solar Collectors.
- Implemented different machine learning methods (*tree-based models e.g., random forests, gradient boosted machines, etc*.) to identify most important variables and interactions among predictors in model.
- Utilized several Monte Carlo sampling methods in model development for hyper parameter tuning.
- Implemented optimization techniques to find the optimum design parameters in heat transfer fluids model.
- Presented results using visualization tools to deliver key insights to non-technical audience.

Education

MicroMaster Statistics and Data Science	Massachusetts Institute of Technology	*present*
Ph.D. Mechanical Engineering	Florida State University	*2018*

Projects

Predicting Complaint Types for Housing Department of NYC (Python).

- Analyzed the most common complaint types in housing department and their corresponding resolution times.
- Identified building characteristics and their impact on different types of complaints.
- Developed a machine learning model to predict the complaint type using the building information.
- Worked with ~25millions of incoming complaint data.
- Recommended prioritization of the complaints based on volume and severity for each geographical area.

Clustering Approaches to Socio-economic Factor (Python).

- Analyzed socio-economic factors of countries across the world.
- Scaled the data before and clustered countries based on similar socio-economic factors together and studied the patterns observed in the clusters.
- Provided insights through visualizations of Kmeans, DBSCAN.

Analysis of School Transportation Experiment for Department of Education (R).

- Evaluated the impact of a new transportation support program which was tested on certain schools.
- Analyzed the effect of program by comparing the parents' financials for the students in treatment and control group using Department of Labor's wage information.
- Joined several large datasets to merge students, schools, parents, and wage data.

- Applied descriptive and inferential statistics to identify whether parents' financials have changed significantly after the launch of new program.
- Suggested next steps to have view of impact by gathering additional income and personal data.

Multi-objective optimization model and multi-parameters sensitivity analysis for a Parabolic Trough Solar Collector (Fortran, R, Matlab).

- Implemented Monte Carlo sampling methods in the sensitivity analysis to explore search space sufficiently for heat transfer fluids with respect to first and second law efficiencies.
- Built an optimization model to select the most important variables and their optimal values in the design of Parabolic Trough Solar Collectors.
- Created visual materials to present findings to both technical and non-technical audience.

Impact of Heat Transfer Fluids on Optimal Parabolic Trough Collector Design (Matlab).

- Evaluated geometric and optical parameters of parabolic trough collector with variance-based global sensitivity analysis.
- Applied feature selection for final modeling to better understand variable importance as well as their effect on target variable.

Predicting Efficiency of Temperature Dependent Heat Transfer Models (Matlab, R).

- Developed four different statistical models for a parabolic trough solar collector by applying heat transfer regression under vacuum condition and air in the gap situation.
- Predicted how each heat transfer parameter effects the model output and how transparent insulating material increases the predicted efficiency of a parabolic trough solar collector.

Volume Element Model for A Parabolic Trough Solar Collector (Matlab, Fortran).

- Developed a hexahedral mesh generation with volume element model to investigate thermal analysis for a parabolic trough solar collector.
- Enhanced the computational efficiency of project with Fortran by working on both thermal and optical analysis.

Certificates

- IBM Machine Learning with Python
- IBM Analyzing Data with Python
- IBM Python for Data Science
- IBM Visualizing Data with Python
- IBM Capstone Project with Python