SAURABH MAHESHWARI

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EDUCATION

MASTER OF SCIENCE Transportation Engineering
University of California, Davis
Davis, CA, USA | Current
GPA – 4/4

BACHELOR OF TECHNOLOGY Civil & Environmental Engineering
Indian Institute of Technology (IIT) Bombay
Mumbai, India | 2017
GPA – 8.67/10

SKILLS: R, MATLAB, Python, Data Analysis, Machine Learning, Linear Programming, Dynamic Programming, MS Office

ACCOMPLISHMENTS

- Co-authored the article 'Kernel machines and firefly algorithm based dynamic modulus prediction model for asphalt mixes considering aggregate morphology' in Construction & Building Materials, Elsevier, Vol 159, pp. 408-416, 2018
- Best Paper Award for presenting 'Understanding effects of crushing mechanism on aggregate morphology using AIMS' at 4th Conference of the Transportation Research Group, India, 2017
- Undergraduate Research Award for contribution to the field of quantification of aggregate shape parameters at IIT Bombay

KEY PROJECTS

Resource allocation for disaster aid to Puerto Rico using linear programming | *UC Davis, CA* [Nov'17]

- Formulated a linear program in Python to optimize the supply of resources, namely food, fuel, building materials and others to various locations at the island, subject to network, supply and storage constraints without exceeding the maximum demand
- Reported various inferences on cost of network capacity and site storage expansion in the case of increased supply or demand

Application of support vector machines and firefly algorithm for predictive modeling | *IIT Bombay, India*

- **Estimation of dynamic modulus of asphalt mixes incorporating the effect of aggregate shape parameters** [Feb'17-May'17]
  - Coupled support vector regression (SVR) with firefly algorithm to predict asphalt stiffness using aggregate shape parameters, test frequency, test temperature and asphalt volumetric properties as independent variables
  - The developed SVR-FA model outperformed the previously developed artificial neural network and SVR models, proving firefly algorithm successful in optimizing SVR hyper-parameters with higher accuracy standards and lesser manual effort
- **Prediction of 85th percentile speed for rural highways** [Aug'16-Jan'17]
  - Predicted highway speed limits using four groups of independent variables namely, physical characteristics of road, traffic parameters, pavement characteristics and accident data
  - Formulated the code in MATLAB for combining firefly algorithm with SVR to optimize the hyper-parameters namely, gamma, sigma and box constraint, that resulted in a model equations with prediction accuracy of over 95%

Dynamic analysis of semi rigid steel frames | *Loughborough University, England* [May'16-Jul'16]

- Coupled finite element tool (SAP2000) with numerical programming software (MATLAB) to assess the dynamic structural response of a 10 storey steel structure using Monte Carlo simulations
- Simulated 36,000 realizations on 36 different models of connection stiffness to analyze parameters such as modal frequencies and modal shapes of 2-D structure and quantify the effect of different level of correlation between stiffness of joints

Effect of crushing mechanism on aggregate shape characteristics | *IIT Bombay, India* [Jun'15-Mar'16]

- Quantified the shape characteristics of aggregates obtained from 2 local sources using Jaw-Horizontal shaft impactor and Jaw-Cone-Vertical shaft impactor as crusher units, using Aggregate Image Measurement system (AIMS)
- Further analyzed the effect of shape properties of aggregates on their packing behavior and stability by conducting four laboratory tests: void in aggregate, angle of repose, direct shear test and fine aggregate angularity

RELEVANT COURSES

Classroom/MOOC: Deterministic optimization and design, R Programming, Exploratory Data Analysis, Machine Learning, Inferential Statistics, Numerical methods in civil engineering, Probabilistic and statistical methods in civil engineering, Traffic design and management, Transportation demand modeling

LEADERSHIP EXPERIENCE

Sports Councilor | *IIT Bombay, India* [Jul'15-Apr'16]

- Elected by 400+ students to lead a team of 6 and mobilize an annual budget of INR 0.3 million
- Oversaw teams for 20 general championships, winning 7 golds, 2 silvers and 1 bronze for first time and upgrading the overall position to 2nd from 6th by sports mentorship