Ruoyun Ma

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EDUCATION

School of Environment, Tsinghua University (THU), Beijing, China 08/2015-Present

- B. Eng. in Environmental Engineering; GPA (overall): **3.62/4.0**; Ranking: **5/71**
- CORE COURSES: Calculus A+, Linear Algebra A, Probability and Statistics A, Environmental Planning A-, Inorganic and Analytical Chemistry A-, Organic Chemistry A-, Physical Chemistry A-, etc. (A/A+: 95-100; A-: 90-94)

School of Economics and Management, THU, Beijing, China 09/2016-Present

- Bachelor of Economics (For Second Bachelor Degree); GPA: 3.60/4.0

INTERNATIONAL CONFERENCE

- **Ruoyun Ma**, Xiaoyi He, Ye Wu*, "Using an Iterative Markov Chain Process to Develop Driving Cycles Based on Large-scale GPS Data: A Case Study in Beijing", **poster session of the 22nd International Transport and Air Pollution Conference (TAP2017)**; Paper submitted. Zurich, Switzerland, 11/2017

RESEARCH EXPERIENCES

State Key Joint Laboratory of Environment Simulation and Pollution Control, THU, Beijing, China
Principle Investigator; Advisor: Prof. Ye Wu (Vice Chair of School of Environment, THU)

The Development of Urban Driving Cycles for Private Cars Based on Markov Chain Process 11/2016-05/2017

- Disposed and preprocessed second-by-second GPS data of several hundred private passenger cars in Beijing by MATLAB, covering over 170,000 sampling days with real-time velocity records. Matched the records with urban road network by ArcGIS software for further spatial analysis.
- Applied Markov Chain method to develop the vehicle driving cycles. Generated sub-cycles that have similar properties as real-world driving based on the original speed-time segments. Selected the candidate cycle with the lowest relative error as the ultimate one. The research has provided a scientific approach for urban driving cycle development.
- Conducted analysis from both spatial and temporal dimensions by generating driving cycle for typical road type and traffic condition, indicating significant differences of driving pattern under distinct conditions. The research has provided an improved basis for emission estimation and fuel consumption simulation.

Optimizing the Location of Urban Electric Vehicle Charging Infrastructures 11/2017-Present

- Extracted charging events from original GPS records by MATLAB. Collected geographic information data of related city and distinguished surface features by ArcGIS.
- Analyzed and estimated charging requirements. Conducted the regress to find the relationship among parking time, surface features, population density and charging duration. Simulated charging events on the scale of the whole city with given information.
- Using operational research model to optimize the utilization ratio of charging infrastructures and convenience for users, under the constraint of the sum of infrastructures and the hypothetical scenarios about electric vehicle owning rate.

The Application of Driving Cycles in Environmental Assessment and Individual Analysis 01/2018-Present

- Simulated the fuel consumption of typical vehicle models by the VSP method based on the derived driving cycles. Concluded that fuel consumption under real-world driving cycles are 15%-30% higher than under regulation cycles (NEDC and WLTC), which presents consistence with previous studies and highlights the importance for developing representative driving cycles for legislation fuel consumption and emission test.
- Testing the volume of data for individual vehicles to generate a robust driving cycle. Using cluster analysis for enhance modeling efficiency. Analyzing individual discrepancy and the effect to fuel consumption and emission assessment.

AWARD AND HONOR

- Member of the 11th THU Spark Program (which selected students (Top 1% university-wide) with talent/potential in scientific research) 12/2017
- Tsinghua-Evergrande Scholarship (top 5%) 09/2017
- Tsinghua-Suzhou Industrial Park Scholarship (top 5%) 09/2016
- Scholarship of Comprehensive Excellence; Academic Excellence Award; Social Work Award, THU 2016; 2107

LEADERSHIP AND ACTIVITIES

Student Union, School of Environment, THU | **Vice Chair** 09/2016-06/2017

- Established cooperative relationship between student union and several successful enterprises (i.e. Want Want Corp), obtaining massive sponsorship for student activities (over ¥ 20,000).
- Planned and organized a series of lectures on student career development, inviting predecessors to share their personal experiences and the market frontier, which were well received by students.

SKILLS

Proficient in **literature research**, **general programming** and **data processing**
Computer Skills: C, MATLAB, ArcGIS, Stata, Origin, Microsoft Office