Teng (Janton) Zeng

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- *In summary: I work in the joint field of transportation electrification and smart grid with optimization and learning techniques as my hammer. My goal is to contribute to the societal green energy revolution and transformation.*

EDUCATION

University of California, Berkeley, Berkeley, CA
Ph.D. in Systems Engineering with optimization and control minor Planned 2023

University of California, Berkeley, Berkeley, CA
M.S. in System Engineering May 2019

University of California, Berkeley, Berkeley, CA
B.S. in Energy Engineering major August 2014 – May 2018

Familiar with:
- Python, MATLAB, PostgreSQL, Java, Js, Arduino, CSS, R, Scheme, C++ (basic)
- Data mining, linear/nonlinear control, machine learning, optimization, reinforcement learning

PROFESSIONAL EXPERIENCE

Energy, Controls, &Applications Lab (eCAL), Berkeley, CA
Graduate Student Researcher – supervised by Prof. Scott Moura May 2017 - present

- Research topic (*lead researcher, ^contributor):
  1. *Joint design of electric freight fleet and charging infrastructure network incorporating urban mobility and energy system (2020-)
     a. keywords: stackelberg game, column generation, vehicle routing problem, network modeling, infrastructure planning (on-going)
  2. *Autonomous electric vehicle (AEV) fleet sizing and charging infrastructure planning (2019-)
     a. keywords: agent-based simulation, bipartite graph, minimum path cover problem (on-going)
     b. ^Department of Energy (DOE) SMART Mobility Advanced Fueling Infrastructure Capstone Report
  3. ^High-performance computation solutions to secure a reliable EV-connected grid future (2021-)
     a. keywords: contraction hierarchy, network modeling, vehicle routing, optimal power flow (on-going)
     b. Lawrence Berkeley National Lab early-career LDRD project (PI: Dr. Bin Wang)
  4. *Optimal operation with human decision modeling at PEV charging station (2019-)
     a. keywords: discrete choice modeling, multi-convex, block coordinate descent, MPC
     b. *Electricity market participation (on-going).
  5. *Optimal planning for plug-in electric vehicle (PEV) charging station (2018-2019)
     a. keywords: overstay, chance-constraint programming
  6. *PEV charging station load profile forecasting (2017, undergraduate)
     - Applied machine learning algorithms for station short-term load forecasting.
     - Data mining 86,000+ chargers' daily utilization data, including time, duration, price, power, etc. (80+ features). 10 slave-systems, one master with PostgreSQL database.

Lawrence Berkeley National Laboratory (LBNL), Grid Integration Group, Berkeley, CA
Student Research Assistant August 2015 - May 2017

- Project topic: Plug-in hybrid electric vehicles lithium-ion battery degradation model written in Python scripts as an extended module to V2G-Simulator (funded by DOE Vehicle Technologies Office, R&D Magazine: *R&D100 awards* recipients).

Technische Universität München (TUM)-CREATE, RP 8 – Energy Management, Singapore
Student Research Assistant May 2016 – August 2016

- Developed MySQL database for Nanyang Technological University (NTU) buses energy consumption data storage and bridged communication between MATLAB and MySQL.
- Nanyang Technological University campus buses energy consumption analysis, identified trends and patterns in each NTU buses, and sought potential improvements to prevent buses from overloading.

LEADERSHIP EXPERIENCE

Smart LeaRning Pilot for Electric Vehicle Charging Stations (SlrpEV), Berkeley, CA
Algorithm and Backend Team Leader Feb 2020 - present

- Oversee and closely work ("Sprint" process) with 7 developers for project software backend design and development, including server, API and database setup, pricing optimization scheme and charging control algorithm design.
- Prototype uniquely designed price-differentiated charging station services at UCSD and UC Berkeley campuses. Weekly report to Smart Energy & Digital Lab at Total S.E. (project sponsor).
- CITRIS and the Banatao Institute Sustainable Infrastructures research testbed for EV research.
- Lead electricity market participation research.

Feynman Technologies, Berkeley, CA
Chief Scientist & Co-Founder Jan 2020 – Present

- Next generation electric vehicle charger and charging service platform
- Berkeley SkyDeck HotDesk Fall 20'
- Interdisciplinary team of 5 people across fields of power electronic, power system and finance.

Charging Robot System, Boston, MA (web, remote)
Chief Scientist for EV Charging July 2020 – Present

- Autonomous and flexible EV charging solution: charging robot / robot valet
- Interdisciplinary team of 10 people across fields of computer vision, robotics, city planning and finance.

Association of Chinese Entrepreneurs (ACE), Berkeley, CA
Core Member September 2018 – Present

JOURNAL PUBLICATIONS

1. **Zeng, Teng*^,** Yiqi Zhao*, Zaid Allybokus, Ye Guo, and Scott Moura. "*Joint Design for Electric Fleet Operator and Charging Service Provider: Understanding the Non-Cooperative Nature*." submitted to *IEEE Transactions on Intelligent Transportation Systems*. (*equal, ^corresponding author)
2. **Zeng, Teng*,** Sangjae Bae*, Bertrand Travacca, and Scott Moura. "Inducing Human Behavior to Maximize Operation Performance at PEV Charging Station." accepted, in early access, *IEEE Transactions on Smart Grid*.
3. **Zeng, Teng,** Hongcai Zhang, and Scott Moura. "Solving overstay and stochasticity in PEV charging station planning with real data." *IEEE Transactions on Industrial Informatics* 16, no. 5 (2019): 3504-3514.
4. Zhang, Hongcai, Colin JR Sheppard, Timothy E. Lipman, **Teng Zeng**, and Scott J. Moura. "Charging infrastructure demands of shared-use autonomous electric vehicles in urban areas." *Transportation Research Part D: Transport and Environment*78 (2020): 102210.
5. Wang, Dai, Jonathan Coignard, **Teng Zeng**, Cong Zhang, and Samveg Saxena. "Quantifying electric vehicle battery degradation from driving vs. vehicle-to-grid services." *Journal of Power Sources* 332 (2016): 193-203.
6. **Zeng, Teng,** Hongcai Zhang, Max Zuo-Jun Shen, Scott Moura. "*How Autonomous Electric Vehicles will Disrupt Urban Ride-hailing Services: Economic and Environmental Impacts.*" prepared, to be submitted.

CONFERENCE PUBLICATIONS

1. Bae, Sangjae, **Teng Zeng,** Bertrand Travacca, and Scott Moura. "Inducing Human Behavior to Alleviate Overstay at PEV Charging Station." In *2020 American Control Conference (ACC) invited session – Smart Grid*, pp. 2388-2394. IEEE, 2020.

JOURNAL REFEREE

- **IEEE (5):** IEEE Transactions on Smart Grid; IEEE Transactions on Power Systems; IEEE Transactions on Industrial Informatics; IEEE Transactions on Transportation Electrification; IEEE Transactions on Intelligent Transportation Systems.
- **IET (2):** IET Smart Grid; IET Electrical Systems in Transportation.
- **Conferences (5):** IEEE PES Power & Energy Society General Meeting (PES-GM); ASME Dynamic Systems and Control (DSC) Conference; American Control Conference (ACC); IEEE Conference on Control Technology and Applications (CCTA); IEEE Conference on Decision and Control (CDC).