Antoni Tong
Sr. Development Engineer, Center for Energy Research
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EXPERIENCE

Senior Engineer University of California San Diego July 2015-present

- Lead the research activity of DoE's ARPA-E CHARGES project evaluating pre-commercial energy storage solutions.
- Oversee battery module testing in the lab and micro-grid integrated battery testing and valuation, working with multiple energy storage startups nationwide.

Post-doc Researcher University of California Davis Aug 2014-June 2015

- Designed machine learning based algorithm for adaptive battery state-of-charge and state-of-health estimation.
- Provided principal design of carbon neutral energy storage system for the California winery.

Graduate Researcher University of California Davis Sept 2010-July 2014

- Designed, planned, and built a stationary energy storage system for an energy efficient house, integrating retired electric vehicle batteries for solar energy storage.
- Developed an energy management software for small scale micro grid, eliminating 90% of peak usage and cutting solar payback time by half.
- Investigated aging patterns of lithium battery through experiments and empirical modeling, incorporated the factor of aging into battery management system design.

Battery Engineer Kleenspeed, Mountain View, CA July 2012-Aug 2012

- Mechanical design of a battery pack including wiring, cooling, and packaging.

DAE Technology, Davis, CA Mar. 2012

- Worked on lithium metal based super capacitor design and manufacturing.
- Prototyping via battery electrode coating, drying, packaging and electrochemical analysis.

SKILLS

- Profound experience in energy storage system (Lithium batteries, flow batteries, super capacitors, and fuel cells) design, integration and management.
- Fluent programming language: Python, Matlab, Java, C.
- Model based simulation and control, machine learning, Kalman filtering, system identification, linear/non-linear optimization, dynamic programming.
- Data visualization: Matlab, Python (matplotlib, seaborn,plot.ly), JavaScript(D3,C3).
- Prototyping: Embedded system (Arduino, BeagleBone), CAD, PCB design and machining.

EDUCATION

Ph.D. Mechanical Engineering University of California Davis July 2014
B.S. Mechatronics Engineering Zhejiang University, China July 2010

PATENT

- S. Tong and J. Park, Methods for on-line estimation of battery SoC and SoH, U.S. Patent Pending 61/902,582, 2013

AWARDS

- Smart grid innovation seed funds, 2014
- Energy innovation small grant, 2011
- Graduate scholarship, University of California Davis, 2010
- Excellent student scholarship, Zhejiang University, 2007-2009
- Winner team of mathematic modeling competition, Zhejiang University, 2008

CONFERENCE TALKS

- ASME Dynamic Systems and Control Conference (DSCC), Palo Alto, CA, 2013
- SAE World Congress, Detroit, MI, 2014
- IEEE International Conference on Smart Grid Communications, Miami, FL, 2015

SYNERGISTIC ACTIVITIES

- Reviewer of renewable journals: IEEE transaction on Smart Grid, Applied Energy, Renewable Energy, Energy Conversion and Management.
- Middle and high school outreach activities: conducting lab tours for student and teacher groups; one hour 'filed tour' section introducing smart home to students; mentoring freshmen students in renewable energy researches.

SELECTED PUBLICATIONS

1. Tong, Shi Jie; Same, Adam; Kootstra, Mark A; Park, Jae Wan; Off-grid photovoltaic vehicle charge using second life lithium batteries: An experimental and numerical investigation Applied Energy, 2013
2. Tong, Shijie; Bachman, John C; Santamaria, Anthony; Park, Jae Wan; Experimental investigation on a polymer electrolyte membrane fuel cell (PEMFC) parallel flow field design with external two-valve regulation on cathode channels, Journal of Power Sources, 2013
3. Tong, Shijie; Klein, Matthew P; Park, Jae Wan; Comprehensive Battery Equivalent Circuit Based Model for Battery Management Application, Dynamic Systems and Control Conference, 2013
4. Tong, Shijie; Klein, Matthew; Park, Jae Wan; Second Life Battery Pack as Stationary Energy Storage for Smart Grid, SAE Technical Paper,2014
5. Kootstra, Mark A; Tong, Shijie; Park, Jae Wan; Photovoltaic grid stabilization system using second life lithium battery, International Journal of Energy Research, 2015
6. Tong, Shijie; Klein, Matthew P; Park, Jae Wan; On-line optimization of battery open circuit voltage for improved state-of-charge and state-of-health estimation, Journal of Power Sources, 2015
7. Klein, M; Tong, S; Park, JW; In-plane nonuniform temperature effects on the performance of a large-format lithium-ion pouch cell, Applied Energy, 2016
8. Tong, Shijie; Fung, Tsz; Park, Jae Wan; Reusing electric vehicle battery for demand side management integrating dynamic pricing, IEEE International Conference on Smart Grid Communications (SmartGridComm), 2015
9. Tong, Shijie; Lacap, Joseph; Park, Jae Wan; Battery State of Charge Estimation Using A Load-Classifying Neural Network Model, Journal of Energy Storage, 2016
10. Tong, Shijie; Fung, Tsz; Park, Jae Wan; Reusing electric vehicle battery for demand side management integrating dynamic pricing, Demonstration of Reusing Electric Vehicle Battery for Solar Storage andDemand Side Management, 2016 (In review)