ALEXANDER DAVID STYLER

Robotics Institute, 5000 Forbes Ave. 15213 • 412-841-9216 • astyler@gmail.com • U.S. Citizen

AREAS OF INTEREST

Machine Learning

- Adaptive systems leveraging reinforcement learning for energy management
- Vehicle load distribution prediction given past observations

Optimization

- Multiple hypothesis optimization for energy management in hybrid and electric vehicles
- Real-time approximation and anytime control for on-board optimization systems

EDUCATION

Carnegie Mellon University
PhD Candidate in Robotics (Expected December 2015)

Carnegie Mellon University
M.S. in Robotics (December 2012)

Carnegie Mellon University
B.S. in Computer Science, Robotics Minor; University Honors (May 2008)

GRANTS AND HONORS

NSF Graduate Research Fellowship
Awarded September 2010 through September 2013

Program Committee, Main Track
Twenty-Ninth AAAI Conference on Artificial Intelligence, 2015

Session Chair
IEEE Forum on Integrated and Sustainable Transportation Systems, FISTS 2011

PUBLICATIONS

Learned Optimal Control of a Range Extender in a Series Hybrid Vehicle,
International Conference on Intelligent Transportation Systems, IEEE (September 2015)

Real-time Predictive Optimization for Energy Management in a Hybrid Electric Vehicle,
Conference on Artificial Intelligence, AAAI (January 2015)

Model Predictive Control with Uncertainty in Human Driven Systems, Conference on Artificial Intelligence, AAAI (June 2013)

ChargeCar Community Conversions: Practical, Electric Commuter Vehicles Now,
International Electric Vehicle Conference, IEEE (March 2012)

Active Management of a Heterogeneous Energy Store for Electric Vehicles, Integrated and Sustainable Transportation Systems, 2011 IEEE Forum (June 2011)

Close These Loopholes - Testing Database Modifications, Simple Talk (September, 2007)

Close those Loopholes - Testing Stored Procedures, Simple Talk (August, 2007)

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PRESENTATIONS

Real-time Predictive Optimization for Energy Management in a Hybrid Electric Vehicle, AAAI (January 2015), Carnegie Mellon University (February 2015)

Model Predictive Control with Uncertainty in Human Driven Systems, Carnegie Mellon University (December 2012), AAAI (June 2013), University of Pennsylvania (November 2013)

Active Management of a Heterogeneous Energy Store for Electric Vehicles, IEEE FISTS 2011 (June 2011), SBLiMotive Research (June 2011)

RESEARCH EXPERIENCE

Predictive Optimization Project, Group Research and Innovation Center, BMW, Munich
Visiting Student, (October-December 2014)

- Created routines to analyze, clean, and distill large driving dataset to be used in real-time for vehicle optimization and control
- Deployed predictive optimization algorithm on prototype BMW i3 Plug-In Hybrid Vehicle
- Demonstrated significantly improved control and efficiency in real-world vehicle tests

ChargeCar Project, CREATE Lab, Robotics Institute, Pittsburgh
Researcher, PhD Candidate (May 2010-present)

- Implemented machine learning prediction system and multiple model optimization for intelligent control and buffering in a heterogeneous energy storage system for vehicles
- Developed approximation techniques to minimize computation and memory footprints for embedded control onboard a vehicle while maintaining performance
- Integrated personal driving history and routes into live EV battery thermal optimization in a collaboration with SBLiMotive and Bosch Automotive
- Developed a methodology for off-rail EV train system design using duty history, factor of safety, and engineering constraints, in collaboration with Bombardier Systems

CREATE Lab, Robotics Institute, Pittsburgh, PA
Software Developer, Master's Student (2008-2010)

- Developed a seamless cross-compilation and remote-debugging interface for VexPro consumer robotic development kit
- Created user-interface and control software used by robotics educational programs for local students and teachers
- Translated Qwerk API from a Java implementation to a C# distributed service model

DRW Trading Group, Chicago, IL
Software Engineering Intern (Summer 2007)

- Developed a library to automate unit testing for database stored procedures, facilitating verification of systems and improving employee efficiency
- Created, tested, and optimized stored procedures for the Quantitative Research team

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TEACHING EXPERIENCE

Girls of Steel Robotics Team, Pittsburgh, PA
Volunteer Student Mentor (2012-2014)

- Taught, supervised, and mentored secondary students for programming and controlling robots for a national competition
- Helped students learn to design and rapidly prototype robots and quickly diagnose failures

Statistical Techniques in Robotics, Carnegie Mellon University**,** Pittsburgh, PA
Teaching Assistant (Fall 2012)

- Presented a guest lecture on statistical filtering techniques for robotics
- Developed and graded coursework and exams, held recitation study sessions

General Robotics, Carnegie Mellon University**,** Pittsburgh, PA
Teaching Assistant and Lab Supervisor (Spring 2006, Spring 2007, Spring 2008)

LEADERSHIP

- President and Event Coordinator of the Robotics Graduate Student Association (2012)
- Organizer of the Faculty & Graduate Student Intramural Volleyball League (2010-2012)
- Member of the School of Computer Science Student Advisory Council (2008)

REFERENCES

Dr. Illah Nourbakhsh, Robotics Institute, Carnegie Mellon University

- Email: illah@cs.cmu.edu
- Phone: 1-412-268-2007

Dr. George Kantor, Robotics Institute, Carnegie Mellon University

- Email: kantor@ri.cmu.edu
- Phone: 1-412-268-7084