

Professional Experience

OpenAI

San Francisco, CA

MEMBER OF TECHNICAL STAFF, ROBOTICS

Mar 2019 - Present

- **Solving Rubik's cube with a robot hand** — Developed software interfaces, infrastructure, and contributed to the Reinforcement learning training setup for the dexterous manipulation task of solving the Rubik's cube with an anthropomorphic robot hand

Periscope Data

San Francisco, CA

SENIOR SOFTWARE ENGINEER

Jul 2016 - Mar 2019

- As part of the platform team, I worked with a tech stack primarily developed in Go and Rails and deployed via Kubernetes. I led design and development of several microservices, and consulted in the architecture of others:
 - Designed and implemented a high-throughput scalable microservice to store and retrieve structured data, that powers Periscope Data's charts interface. The service supported APIs for timestamp based retrieval of records and query interfaces for updated records.
 - Deployed and maintained a RabbitMQ cluster on Kubernetes with StatefulSets. Developed a RabbitMQ client library in Go for fault-recovery and efficient AMQP connection pooling
 - Worked on JDBC APIs for different databases for connection pooling over SOCKS proxy
 - Designed and maintained a cloud storage service that serves the filtering interface of BI dashboards, backed by Redis. The service supported a search API for filter values.

University of California at Berkeley

Berkeley, CA

GRADUATE STUDENT RESEARCHER

2010-2016

- Developed a learning and optimization toolkit for building data-driven applications using cooperative robotics and Internet-of-Things
- Developed data-driven techniques for randomized control, applied to the domains of home automation and robotic surveillance
- Studied fault modeling, anomaly detection and streaming data analytics for industrial cyber-physical systems

Twitter, Inc.

San Francisco, CA

SOFTWARE ENGINEERING INTERN

May 2014 - Aug. 2014

- Developed tools for traffic analysis and back-end testing as part of the Core Storage Shared Services Team

Pacific Northwest National Laboratory

Richland, WA

PH.D. RESEARCH INTERN

May 2012 - Aug. 2012

- Studied modeling and uncertainty analysis of network aspects for distributed cyber-physical energy systems
- Experimented with model-based design and analysis of coordinating smart-grid sensor data

National University of Ireland, Maynooth

Maynooth, Republic of Ireland

UNDERGRADUATE RESEARCH INTERN

June 2009 - Aug. 2009

- Conducted research on real-time object detection and tracking for the RoboCup humanoid robotic soccer league

Education

University of California at Berkeley

Berkeley, CA

PH.D. IN ELECTRICAL ENGINEERING AND COMPUTER SCIENCES

2010 - 2016

- Thesis Title: Data-Driven Cyber-Physical Systems via Real-Time Stream Analytics and Machine Learning
- Thesis Advisor: Edward A. Lee

Bilkent University

Ankara, Turkey

B.S. IN ELECTRICAL AND ELECTRONICS ENGINEERING

2006 - 2010

- *Salutatorian*

Skills

Programming Languages Python, Go, Java, Ruby on Rails, JavaScript/CoffeeScript, HTML5/CSS, MATLAB, C++, R

Frameworks TensorFlow, PyTorch

Systems/Tools Kubernetes, Docker, Unix, ROS

Selected Publications

RELEASES

- **OpenAI:** [Akkaya, I.](#), Andrychowicz, M., Chociej, M., Litwin, M., McGrew, B., Petron, A., Paino, A., Plappert, M., Powell, G., Ribas, R., Schneider, J., Tezak, N., Tworek, J., Welinder, P., Weng, L., Yuan, Q., Zaremba, W., Zhang, L. **"Solving Rubik's Cube with a Robot Hand."** October 2019. [\[ArXiv\]](#)

THESIS

- [Akkaya, I.](#) **Data-Driven Cyber-Physical Systems via Real-Time Stream Analytics and Machine Learning.** December 2016.

JOURNAL PAPERS

- [Akkaya, I.](#), Derler, P., Lee, E.A. **Systems Engineering for Industrial Cyber-Physical Systems Using Aspects.** In Proceedings of the IEEE, May 2016.
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- Valle, R., Donzé, A., Fremont, D.J., [Akkaya, I.](#), Seshia, S.A., Freed, A., Wessel, D. **Specification Mining For Machine Improvisation With Formal Specifications.** (to appear) In ACM Computers in Entertainment.

BOOK CHAPTERS

- [Akkaya, I.](#), Liu, Y., Lee, E.A. **Modeling and Simulation of Network Aspects for Distributed Cyber-Physical Energy Systems.** Cyber Physical Systems Approach to Smart Electric Power Grid. 2014.

CONFERENCE AND WORKSHOP PAPERS

- [Akkaya, I.](#), Fremont, D., Valle, R., Donzé, A., Lee, E.A., and Seshia, S. **Control Improvisation with Probabilistic Temporal Specifications.** In Proceedings of the 1st IEEE International Conference on Internet-of-Things Design and Implementation (IoTDI). 4-7 April 2016. **(Best Paper Award)**
- Emoto, S., [Akkaya, I.](#), Lee, E.A. **Cooperative Multi-Robot Information Acquisition based on Distributed Robust Model Predictive Control.** (submitted to) 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems, 9, October, 2016.
- [Akkaya, I.](#), Emoto, S., Lee, E.A. **PILOT: An Actor-Oriented Learning and Optimization Toolkit for Robotic Swarms** at the Second International Workshop on Robotic Sensor Networks, part of Cyber-Physical Systems Week, Seattle, WA, USA, April 13, 2015.
- Wasicek, A., Lee, E.A., Kim, H., Greenberg, L., Iwai, A., and [Akkaya, I.](#) **System simulation from operational data.** In Proceedings of the Design Automation Conference (DAC), June, 2015.
- [Akkaya, I.](#), Liu, Y., Lee, E.A., Gorton, I. **Modeling Uncertainty for Middleware-based Streaming Power Grid Applications** In Proceedings of Middleware For Next Generation Internet Computing Workshop (MW4NG). December 2013.
- [Akkaya, I.](#), Lee, E.A. and Derler, P. **Model-Based Evaluation of GPS Spoofing Attacks on Power Grid Sensors.** In Proceedings of the IEEE Workshop on Modeling and Simulation of Cyber-Physical Energy Systems (MSCPES'13), May 2013.
- [Akkaya, I.](#), Liu, Y. and Gorton, I. **Modeling and analysis of middleware design for streaming power grid applications.** In Proceedings of the Industrial Track of the 13th ACM/IFIP/USENIX International Middleware Conference. 2012.
- Matic S., [Akkaya, I.](#), Zimmer M., Eidsoncv J, Lee E.A. **PTIDES Model on a Distributed Testbed Emulating Smart Grid Real-Time Applications.** In IEEE Conference on Innovative Smart Grid Technologies (ISGT-EUROPE), December 2011.

Honors & Awards

2016	Best Paper Award , "Control Improvisation with Probabilistic Temporal Specifications", IoTDI 2016	Berlin, Germany
2015	Invited Presenter , Rising Starts in EECS: An academic career workshop for women, MIT	Cambridge, MA
2011	Departmental Fellowship , University of California at Berkeley	Berkeley, CA
2009	ERASMUS Summer Internship Grant , SIAR: Summer Internships in Autonomous Robotics	Maynooth, Ireland
2006	Merit-based Full Educational Scholarship , Bilkent University	Ankara, Turkey

Teaching Experience

2015, 2012	EE 20 - Introduction to Signals and Systems , Graduate Student Instructor	UC Berkeley
2008	EE 211 - Analog Electronics , Undergraduate Teaching Assistant	Bilkent University