Qianlin Liang

165 Brittany Manor Drive, Amherst, MA, 01002
qliang@cs.umass.edu • (413) 404-8659 •

EDUCATION

University of Massachusetts, Amherst, MA, USA

- Ph.D in Computer Science — Aug. 2018 – Present
  - Research Direction: Distributed Systems for Artificial Intelligence, Edge Computing and Energy Informatics
- M.S. in Computer Science — Aug. 2018 – Dec. 2020
  - Cumulative GPA: 3.94/4.00

The Pennsylvania State University, University Park, PA, USA

- B.S.(Hons.) in Computer Science — Aug. 2012 – May 2016
  - Minor in Mathematics
  - Thesis: A Study of Price and Capacity Trade-Offs of Replicating Computation on the Public Cloud
  - Cumulative GPA: 3.91/4.00

RESEARCH EXPERIENCE

Laboratory for Advanced Systems Software, University of Massachusetts

- Graduate Researcher, CICS Department — Aug. 2018 – Present
  - Designed and implemented carbon-efficient system for elastic ML training workloads
  - Developed runtime system for energy-efficient execution of DNN-based IoT applications on shared edge accelerators
  - Designed and implemented cluster resource management algorithms to intelligently manage multiple applications on edge accelerators while respecting their runtime SLOs
  - Analyzed the architecture benefits and limitations of specialized edge accelerators when compare to traditional edge and cloud-based systems
  - Explored distributed processing capabilities, such as split processing for deep learning models, of edge and cloud

Computer Systems Lab, The Pennsylvania State University

- Undergraduate Research Student, CSE Department — May 2015 – May 2016
  - Analyzed Amazon EC2 Spot market history price and developed statistic model to predict EC2 Spot market price
  - Implemented controller to launch, terminate and run jobs on EC2 instances programactically
  - Designed and implemented algorithm for EC2 users to lessen their cost while maintaining high reliability

PUBLICATIONS

[1] **Ecovisor: A Virtual Energy System for Carbon-Efficient Applications**. Abel Souza, Noman Bashir, Jorge Murillo, Walid Hanafy, Qianlin Liang, David Irwin, Prashant Shenoy. Under review.

[2] **Adaptive Multi-Exit DNN Execution for On-Device AI**. Qianlin Liang, Walid A. Hanafy, Ahmed Ali-Eldin, David Irwin, Prashant Shenoy. Under review.

[3] **Model-driven Cluster Resource Management for AI Workloads in Edge Clouds**. Qianlin Liang, Walid A. Hanafy, Ahmed Ali-Eldin, Prashant Shenoy. Under review.

[4] **AI on the Edge: Rethinking AI-based IoT Applications Using Specialized Edge Architectures**. Qianlin Liang, Prashant Shenoy, David Irwin. In Proceedings of IEEE International Symposium on Workload Characterization, October 2020.

[5] **Exploiting Spot and Burstable Instances for Improving the Cost-efficacy of In-Memory Caches on the Public Cloud**. Cheng Wang, Bhuvan Urgaonkar, Aayush Gupta, Qianlin Liang, and George Kesidis. In Proceedings of the European Conference on Computer Systems (EUROSYS 2017), Belgrade, Serbia, April 2017.

[6] **An Empirical Analysis of Amazon EC2 Spot Instance Features Affecting Cost-effective Resource Procurement**. Cheng Wang, Qianlin Liang, and Bhuvan Urgaonkar. In ACM/SPEC International Conference on Performance Engineering (ICPE 2017), L'Aquila, Italy, April 2017.

[7] **Spot Characterization: What are the Right Features to Model?** Qianlin Liang, Cheng Wang, and Bhuvan Urgaonkar. In Proceedings of the First International Workshop on System Analytics and Characterization (SAC 2016), co-located with ACM SIGMETRICS 2016, Antibes Juan-les-pines, France, June 2016.

TEACHING EXPERIENCE

University of Massachusetts Amherst – Teaching Assistant

- Reasoning Under Uncertainty (COMPSCI 240) Spring 2020
- Introduction to Informatics (INFO 101) Fall 2018

AWARDS

- The Evan Pugh Scholar Award, The Pennsylvania State University 2015
  For undergraduate juniors and seniors who are in the upper 0.5 percent of their respective classes.
- The President Sparks Award, The Pennsylvania State University 2014
  For earning a 4.00(A) cumulative grade point average based on at least 36 graded credits.
- The President's Freshman Award, The Pennsylvania State University 2013
  For earning a 4.00(A) cumulative grade point average based on at least 12 graded credits.

PROFESSIONAL EXPERIENCE

Shanghai Rajax Information Technology Co., Ltd
Shanghai, China

- Data Scientist Aug. 2016 – May 2018
  - Performed feature engineering to create features which improved forecast accuracy of various predictive models.
  - Designed supply and demand pricing model to improve service quality during peak time
  - Developed algorithms to cluster operating area and improve operating efficacy and efficiency

SKILLS

- Programming: Python, C/C++, Java, JavaScript, HTML5, Matlab, Bash, LaTeX
- Data Science Framework: Tensorflow, Pytorch, Numpy, Pandas, Scipy, Sklearn
- Operating Systems: UNIX/Linux, OS X, Windows
- Cloud Computing: Docker, Kubernetes, AWS