Dr. Meghan Clark

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Education

PhD in Computer Science, University of California, Berkeley 2021
MS in Computer Science and Engineering, University of Michigan 2017
BS in Computer Science, minor in Mathematics, summa cum laude, George Mason University 2012

Employment

Postdoctoral Scholar, UC Berkeley 2021-2022
Graduate Research Assistant, UC Berkeley 2017-2021
Graduate Research Assistant, University of Michigan 2012-2017
Software Engineer, Oakwood Controls Jan–June 2012

Awards

Fellow, NSF Graduate Research Fellowship (GRFP) 2014-2017

Projects

Infrastructure-as-Code Tooling, UC Berkeley 2022
- Developed Terraform and Ansible infrastructure-as-code tools for creating Kubernetes clusters on AWS Elastic Kubernetes Service (EKS) and managing EC2 instances.

Mixed Reality Network Introspection (video link), UC Berkeley 2019–present
- Instrumented WiFi and OpenThread mesh sensor networks to collect real-time network telemetry.
- Developed VR/AR app to view real-time or historical communications using a headset.
- Received three-year DARPA special project funding to continue development.

Automotive Network Visualization, UC Berkeley 2021
- Collaborated with IBM Research team on collaborative perception in vehicular networks.
- Developed visualization of network communications between vehicles and infrastructure.
- Work presented at GNU Radio Conference 2021 (GRCon'21).

Augmented Reality IoT Android App With Intelligent Assistant, UC Berkeley 2020–2021
- Developed augmented reality Android app that reveals locations of smart home devices.
- Conducted user study of impact on interactions with smart home intelligent assistants.
- Published results in ACM IMWUT 2022 (Ubicomp).

Open Source IoT Networking Library - lifxlan (GitHub) 2015–present
- Created lifxlan, a popular open source Python library - 450+ stars.
- Implemented UDP-based network protocol to communicate with LIFX wireless light bulbs.

Machine Learning for Smart Lighting Control, UC Berkeley 2017
- Implemented LSTM deep learning recurrent neural network (RNN) using Python Keras framework.
- Trained system to anticipate when home residents will turn on lights and do it for them automatically.

Intelligent Assistants in Smart Homes, University of Michigan and UC Berkeley 2015-2020
- Collected foundational data on smart home intelligent assistant interactions for PhD dissertation.
- Published and presented results at ACM IMWUT 2017 (Ubicomp) and DATA 2018.

Smart Home Telepresence Application and Runtime, University of Michigan 2015-2016
- Developed a provocative telepresence application and microservice runtime to run in smart homes.
- Presented to industry stakeholders, including Amazon Lab126 and Mozilla Connected Devices group.
- Published and presented system at IoT-App 2015.

Machine Learning for Energy-Harvesting Sensors, University of Michigan 2014-2015
- Developed and evaluated machine learning algorithm to convert unitless measurements from simple, non-intrusive energy-harvesting power sensors into Watts.
- Published and presented results at ACM e-Energy 2014.

Fully Homomorphic Encryption Benchmarking, University of Michigan 2013
- Implemented and benchmarked a new bootstrapping-free Learning-with-Errors FHE scheme.
- Showed the LWE scheme outperformed a prior AGCD scheme given realistic security parameters.

Cyber-Physical Controls Optimization on a Tabletop Satellite, University of Michigan 2012-2013
- Implemented optimal control scheme and collected sensor data from a tabletop satellite.
- Published and presented paper in AIAA Infotech@Aerospace 2013.

High-Dimensional Data Partitioning with Space-Filling Curves, University of Michigan 2012

- Compared effectiveness of different space-filling curves for partitioning data across HPC cores.
- Presented results at the Rackham Summer Institute.

Military Sensor Network Protocols, Oakwood Controls 2012

- R&D work for the U.S. Army's Night Vision and Electronic Sensors Directorate (NVESD) on automatic discovery, configuration, and control of heterogeneous sensor networks.

SKILLS

Languages: Python, C#, Javascript, Node.js, C, Golang, Java, Erlang
Frameworks: MERN web stack (Mongo, Express, React, Node.js), Unity, Android
Cloud and Microservices: AWS, Docker, Docker Compose, Kubernetes, EKS, Terraform, Ansible
AI/ML: Keras, neural networks, RNNs. Exposure to PyTorch, TensorFlow, CNNs, transformers, yolo
Embedded Systems: Raspberry Pi, C, Arduino, PCB design (EAGLE), soldering, machining
Mixed Reality: Unity SteamVR, Android ARCore, A-Frame, WebXR
Radio: Amateur Radio License - General (KN6THQ)

SELECTED PUBLICATIONS

[1] **Meghan Clark**, Mark W. Newman, and Prabal Dutta. "ARticulate: One-Shot Interactions with Intelligent Assistants in Unfamiliar Smart Spaces Using Augmented Reality." *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, Vol. 6, No. 1, 2022.

[2] Thomas Zachariah, **Meghan Clark**, and Prabal Dutta. "Bluetooth Low Energy in the Wild Dataset." *Proceedings of the First Workshop on Data Acquisition To Analysis (DATA '18)*, 2018.

[3] **Meghan Clark** and Prabal Dutta. "The Big House Dataset: Desired Applications and Interactions." *Proceedings of the First Workshop on Data Acquisition To Analysis (DATA '18)*, 2018. **Presented talk at DATA.**

[4] Noah Klugman, **Meghan Clark**, Matthew Podolsky, Pat Pannuto, Jay Taneja, and Prabal Dutta. "You Can't Teach a New Phone Old Tricks: Smartphones Resist Traditional Compute Roles." *GetMobile: Mobile Computing and Communications*, Vol. 23, No. 1, 2019.

[5] Noah Klugman, Veronica Jacome, **Meghan Clark**, Matthew Podolsky, Pat Pannuto, Neal Jackson, Aley Soud Nassor, Catherine Wolfram, Duncan Callaway, Jay Taneja, and Prabal Dutta. "Experience: Android Resists Liberation from Its Primary Use Case." *Proceedings of the 24th Annual International Conference on Mobile Computing and Networking (MobiCom'18)*, 2018.

[6] **Meghan Clark**, Prabal Dutta, and Mark W. Newman. "Devices and Data and Agents, Oh My: How Smart Home Abstractions Prime End-User Mental Models." *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, Vol. 1, No. 2, 2017. **Presented talk at Ubicomp.**

[7] Bradford Campbell, **Meghan Clark**, Samuel DeBruin, Branden Ghena, Neal Jackson, Ye-Sheng Kuo, and Prabal Dutta. "Perpetual Sensing for the Built Environment." *IEEE Pervasive Computing*, Vol. 15, No. 4, 2016.

[8] **Meghan Clark** and Prabal Dutta. "The Haunted House: Networking Smart Homes to Enable Casual Long-Distance Social Interactions." *The 2015 International Workshop on Internet of Things towards Applications (IoT-App'15)*, 2015. **Presented talk at IoT-App.**

[9] **Meghan Clark**, Bradford Campbell, and Prabal Dutta. "Deltaflow: Submetering by Synthesizing Uncalibrated Pulse Meter Streams." *The 5th International Conference on Future Energy Systems (ACM e-Energy)*, 2014. **Presented talk at ACM e-Energy.**

[10] Justin M. Bradley, **Meghan Clark**, Ella M. Atkins, and Kang G. Shin. "Mission-Aware Cyber-Physical Optimization on a Tabletop Satellite." *AIAA Infotech@Aerospace (I@A) Conference*, 2013. **Presented talk at AIAA Infotech@Aerospace.**