

Research Interests

- Deep Learning- and Image Processing- based distributed cyberinfrastructure data analytics of Cyber-Physical Systems (e.g., smart cities, smart homes, Internet of Things, etc.).
- I design and implement a wide range of open-sourced data-driven computer systems.

Education

- Colorado School of Mines
 - ◆ Ph.D. candidate in Computer Science, Research Assistant since Spring 2022.
 - ◆ Advisor: Dr. Dong Chen.
- Florida International University.
 - ◆ Ph.D. candidate in Computer Science, Research/Teaching Assistant, from Spring 2019 to Fall 2021.
 - ◆ Advisor: Dr. Dong Chen.
- Northeastern University, China. (985 Project, 211 Project)
 - ◆ M.S. in Control Engineering, from Sep. 2016 to Dec. 2018.
- China University of Petroleum. (211 Project)
 - ◆ B.S. in Automation, from Sep. 2012 to Jun. 2016.

Publications (Conferences)

- [CNS'22] Qi Li, Keyang Yu, Dong Chen, Mo Sha and Long Cheng. “*TrafficSpy: Disaggregating VPN-encrypted IoT Network Traffic for User Privacy Inference.*”. In Proc. of the 10th IEEE Conference on Communications and Network Security (CNS 2022), 3-5 October 2022, Austin, Texas, USA. Acceptance Rate = 35.25%.
- [IPSN'20] Qi Li, Yuzhou Feng, Yuyang Leng, Dong Chen. “*SolarFinder: Automatic Detection of Solar Photovoltaic Arrays*”. In Proceedings of the 19th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN'20), April 21-24, 2020, Sydney, Australia, Acceptance Rate = 21.77%.
- [IPSN'21] Keyang Yu, Qi Li, Dong Chen, Mohammad Rahmann, and Shiqiang Wang. “*PrivacyGuard: Enhancing Smart Home User Privacy*”. In Proc. of the 20th ACM/IEEE International Conference on Information Processing in Sensor Networks, (IPSN'21), May 18–21, 2021, Nashville, TN, USA. Acceptance Rate = 24.76%.
- [IGSC'20] Qi Li, Keyang Yu, Dong Chen. “*SolarDiagnostics: Automatic Rooftop Solar Photovoltaic Array Damage Detection*”. In Proceedings of the 11th International Green and Sustainable Computing Conference (IGSC'20), October 19-22, 2020, Acceptance Rate = 23%.
- [BuildSys'20] Yuzhou Feng, Qi Li, Dong Chen and Raju Rangaswami. “*SolarTrader: Enabling Distributed Solar Energy Trading in Residential Virtual Power Plants*”. In Proceedings of the 7th ACM International Conference on Systems for Energy-Efficient Built Environments (BuildSys'20), November 16-19, 2020, Yokohama, Japan, Acceptance Rate = 24%. **Best Paper Award**
- [BuildSys'20] Qi Li, Keyang Yu, Dong Chen. Poster: “*Automatic Damage Detection on Rooftop Solar Photovoltaic Arrays*” In Proceedings of the 7th ACM International Conference

on Systems for Energy-Efficient Built Environments (BuildSys'20), November 16-19, 2020, Yokohama, Japan.

- [Wisec'19] Qi Li, and Dong Chen. "*Exposing the location of anonymous solar-powered homes: poster.*" In Proceedings of the 12th Conference on Security and Privacy in Wireless and Mobile Networks, pp. 324-325. 2019.

Publications (Journals)

- Qi Li, Keyang Yu, and Dong Chen. "*Automatic Rooftop Solar Photovoltaic Array Damage Detection*". Sustainable Computing: Informatics and Systems.

Research Experience

- TrafficSpy: Disaggregating VPN-encrypted IoT Network Traffic for User Privacy Inference.
<https://github.com/cyber-physical-systems/trafficspy>
 - we design a new factorial hidden Markov model (FHMM)-based smart home network traffic disaggregator—TrafficSpy that can accurately disaggregate VPN-encrypted whole-house IoT network traffic data into individual IoT device network traffic data.
- PrivacyGuard: Enhancing Smart Home User Privacy
<https://github.com/cyber-physical-systems/PrivacyGuard>
 - we design a new low-cost, open-source user “tunable” defense system—PrivacyGuard that enables users to significantly reduce the private information leaked through IoT device network traffic data.
- SolarTrader: Enabling Distributed Solar Energy Trading in Residential Virtual Power Plants.
<https://github.com/cyber-physical-systems/SolarTrader>
 - We design a new solar energy trading system - SolarTrader that enables unsupervised, distributed, and long term fair solar energy trading in residential VPPs.
- SolarDiagnostics: Automatic Rooftop Solar Photovoltaic Array Damage Detection.
<https://github.com/cyber-physical-systems/SolarDiagnostics>
 - We design a new system - SolarDiagnostics that can automatically and accurately detect and localize any damage that may exist on rooftop solar PV arrays using their rooftop images with a lower cost.
- SolarFinder: Automation Detection of Solar photovoltaic Arrays.
<https://github.com/cyber-physical-systems/SolarFinder>
 - We design a new system -- SolarFinder that can automatically detect distributed solar PV arrays in a given geospatial region without any extra cost.
 - SolarFinder leverages multidimensional K-means algorithm, support vector machine modeling and deep convolutional network approach.
- Present 3D Unet convolutional neural network for lung nodule classification
 - Using the platform giving by Ali cloud to analyze the big data of CT scans
 - Design a 3D Unet network to detect nodules in 3D lung CT scans, assign the possibility of getting cancer.
- Cardiovascular OCT vulnerable plaque recognition ---cccv 2017 contest
 - Design a new algorithm that can detect the localization of vulnerable plaque using deep learning method.
 - write the codes that implement the algorithm using python language, caffe deep learning framework.

Research Experience, Teaching Experience and Services

➤ Research Assistant

- Cyber-Physical Systems Laboratory (CPSLab), Florida International University, Fall 2020.
- Data-driven Cyber-Physical Systems (D2CPS) Laboratory, Colorado School of Mines, Spring 2022.

➤ Teaching Assistant

- COP 4610 Operating System, Florida International University, Fall 2019.
- COP 5614 Operating System, Florida International University, Spring 2019
- Machine Learning in NSF RET Program, Florida International University, Summer 2020
- COP2210 Programming 1, Florida International University, Spring 2020
- COP 4610 Operating System, Florida International University, Fall 2021
- CSCI 442 Operating System, Colorado School of Mines, Fall 2022

➤ ACM Conference Volunteer

- ACM SenSys'20 and BuildSys'20 Joint Conference Student Volunteer.
- NSF IGSC'20 travel grant
- NSF CNS'20 travel grant
- Mines GSG travel grant

Awards

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| ● SCIS Best Research Student Award. | Dec.2020 |
| ● IGSC 2020 NSF-funded student participation award | Oct. 2020 |
| ● National Scholarship (5 %) | Dec.2017 |
| ● The third prize in Cardiovascular OCT vulnerable plaque recognition contest | Oct.2017 |
| ● Outstanding Graduates in Shandong Province | Jul.2016 |

Diversity Statement: Qi Li, Ph.D. Candidate (liqi@mines.edu)

Data-driven Cyber-Physical System Laboratory, Colorado School of Mines

As a woman in Computer Science, I have been committed to diversity since high school. There were only a few female peer students in class. I fully understand the barriers faced by women and other minorities in the Science area. Luckily, I have benefitted from the opportunities for women in Computer Science at both the department level and university levels during my undergraduate and graduate experience. Thus, I truly understand the importance of creating an equal-opportunity environment to encourage and inspire students to communicate and collaborate with each other. I really appreciate the opportunities they offer to help me achieve my academic and research success. As a faculty, I will embrace and welcome students and faculty regardless of their race, ethnicity, gender, religion, or sexual orientation.

During my graduate study, I have been involved with Women in Computer Science at the Colorado School of Mines and Florida International University. These events encourage women faculty and students in Science, Engineering, and Mathematic programs to share their experiences and discuss gender-related challenges. These events also reach out to high schools and middle schools to encourage female students to become interested in science. I volunteered to introduce my research work to young women many times to encourage more women to pursue science.

As a faculty member, I would continue to contribute to diversity teaching and research. First, I would welcome Latino, African American, gay, and women students into my own research group. I will make sure to advise them and provide them with the resources they need to achieve academic and research success. Second, being a female faculty, I would actively organize or participate in seminars/workshops which are designed to help and support female students. I would guide them on how to solve the challenges based on past successes and failures. I am excited to pass on my own experience to the female students. I would also invite other faculties to share their experience and give career advice. Third, promoting diversity is not only about gender equality, it must also include creating an equal environment for underrepresented minority students. Similarly, I would also encourage and help students from underrepresented groups to enroll in science courses and academic research in which they are interested. Especially, I would also like to organize some programming programs. I understand that minorities may normally struggle at the start of their study in science because some concepts are difficult to understand. The programming programs can help them be well-prepared for STEM fields. The biggest benefit of the programming programs is that they offer an opportunity where minorities can communicate and discuss with peer students. This process will help them solve problems, and at the same time, it can also help them gain confidence.

As a computer science professor, I strive to inspire students from underrepresented groups to pursue studies in STEM fields through programs, and the role of a teacher and a research advisor. I will also recruit and train minority graduate students in my research lab and provide as much support as possible to encourage them in their academic careers.