MD RAKIB SHAHRIAR, PH.D.

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CAREER OBJECTIVE

Currently, I am working as a *Postdoctoral Associate* of **Dr. Mark Tehranipoor** at the Florida Institute of Cybersecurity Research (**FICS**) at the **University of Florida** at Gainesville. I lead multiple research projects to design secure electronics supply-chain throughout their production life cycle, provenance, traceability, and assurance. Towards this direction, I continuously seek the digital transformation of physical things and processes using *Cyber-Physical Systems, Internet of Things, Service Computing, Cloud Computing, Edge Computing, Blockchain, and Digital Twins*. Besides secure semiconductors, I also research to design *sustainable and resilient* aerospace infrastructure.

I obtained my Ph.D. Under the supervision of **Dr. Xiaoqing "Frank" Liu** from the University of Arkansas. I developed a novel cloud-based cyber manufacturing model where manufacturing resources are directly virtualized in the cloud. Published articles stemmed from this work have received **140+** citations from peer-reviewed research articles. Continued work on this research resulted in the design and implementation of service-oriented Digital Twins of physical machine tools for cloud platforms. To this date, my published research as a Ph.D. student has received **~200 citations**.

EDUCATION

Ph.D. University of Arkansas July 2020
Computer Science
Dissertation Title: ***Towards a Cyber-Physical Manufacturing Cloud through Operable Digital Twins and Virtual Manufacturing Production Lines***
GPA: 3.71

B.Sc. Bangladesh University of Engineering & Technology October 2009
Computer Science and Engineering

LIST OF PRIMARILY CONTRIBUTED PUBLICATIONS (TOTAL 10)

Published Journals Papers

- Liu, Xiaoqing F., **Md Rakib Shahriar**, SM Nahian Al Sunny, Ming C. Leu, and Liwen Hu. "Cyber-physical manufacturing cloud: Architecture, virtualization, communication, and testbed." Journal of Manufacturing Systems 43 (2017): 352-364.

Published Conference Papers

- **Md Rakib Shahriar**, Liu, Xiaoqing F., Rahman, Md Mahfuzer, & Al Sunny, S.M. Nahian "OpenDT: A Reference Framework for Service Publication and Discovery using Remote Programmable Digital Twins". 2020 IEEE International Conference on Service Computing.
- Liu, Xiaoqing Frank, **Md Rakib Shahriar,** S. M. Sunny, Ming C. Leu, Maggie Cheng, and Liwen Hu. "Design and implementation of cyber-physical manufacturing cloud using MTConnect." In ASME 2016 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference. American Society of Mechanical Engineers Digital Collection, 2016.
- **Shahriar, Md Rakib**, SM Nahian Al Sunny, Xiaoqing Liu, Ming C. Leu, Liwen Hu, and Ngoc-Tu Nguyen. "MTComm Based Virtualization and Integration of Physical Machine Operations with Digital-Twins in Cyber-Physical Manufacturing Cloud." In 2018 5th IEEE International Conference on Cyber Security and Cloud Computing (CSCloud)/2018 4th IEEE International Conference on Edge Computing and Scalable Cloud (EdgeCom), pp. 46-51. IEEE, 2018.

Patent

- Liu, Xiaoqing, SM Nahian Al Sunny, and Md Rakib Shahriar. "Semantic Ontology-Based Internet Scale Communication Method of Machine Tools for Providing Remote Operational Services." U.S. Patent Application 16/020,795 filed December 27, 2018. (Under Review – personal contribution is 20%)

RESEARCH EXPERIENCE

University of Florida, Gainesville FL August 2020 - present
Postdoctoral Associate
Supervisor: Mark Tehranipoor

- *Project 1:* Design and development of Blockchain network for securing semiconductor manufacturing supply chain. I directly mentor multiple PhD students in this project in their research and development duties.
- *Project 2:* Design and development of Digital Twins technology to improve supply-chain security for semiconductor manufacturing.

University of Arkansas, Fayetteville AR August 2015 – August 2020
Graduate Research Assistant
Supervisor: Xiaoqing Frank Liu

- *Project 1*: Architecture, Virtualization, Communication and Testbed implementation of **Cyber-Physical Manufacturing Cloud** (August 2015-July 2017)
- *Project 2*: Design and development of **Operable Digital Twins** in Cyber-Physical Manufacturing Cloud using MTComm (August 2017-February 2018)
- *Project 3*: Towards Virtual Manufacturing through Collaboration of Operable Digital Twins to construct **Virtual Assembly Lines** in Cyber-Physical Manufacturing Clouds (March 2018-June 2020)
- *Project 4*: Developing a novel approach for publication and discovery of service-oriented Digital Twins. (January 2020-June 2020)
- *Research Skills*: **Digital Twins,** Cyber-Physical Systems, Cloud Computing, Interdisciplinary collaborations.

PROFESSIONAL SERVICES

- Editorial Board Member: Automation, Control, and Intelligent Systems(ACIS) by Science Publishing Group Inc.
- *Peer Reviewing*: Reviewed 25+ manuscripts in prestigious journals such as IEEE Transactions on Industrial Informatics (4), IEEE Access (6), Springer Cybersecurity (6), etc. (Find my on Publons as *Md Rakib Shahriar*)

TEACHING EXPERIENCE

University of Arkansas, Fayetteville AR August 2017 – May 2020
Graduate Teaching Assistant
Reporting to: Professor Xiaoqing F. Liu, Dr. Reid Phillips
Course: CSCE 3513 – Software Engineering

Responsibilities

Grading and teaching: worked as a grader in the Software Engineering class; *Teaching*: taught in classes on the topics of Software Engineering Ethics, Software Development Process Models, Unified Model Language (UML), and Software Configuration Management (SCM); *Mentoring*: helping students towards the implementation of their term projects.

MAJOR COURSES

Advanced Individual Study on Blockchain Technologies: I investigated different applications of Blockchain technologies to develop anti-counterfeit mechanisms. I developed an anti-counterfeit method for cloud additive manufacturing systems.

Cloud Computing: I learned concepts and architectures of Cloud Computing platforms. I also used MapReduce and Spark to create some document analyzing applications.

Machine Learning: I learned how to develop a neural network from the sketch. I started with developing the initial neurons and eventually ended up developing a deep neural network (including a generative neural network) in this course.

Wearable and Ubiquitous Computing: Developed a mechanism to optimize computing resources for Digital Twins using Arduino, Raspberry Pi, AWS and Terraform.

TECHNICAL SKILLS

Coding/Scripting: Java, C, JavaScript, Python, SQL, NoSQL. **Frameworks & Tools:** J2SE, J2EE, AngularJS, Scikit-learn, MapReduce, Hadoop, Hbase, Three.js, Blend4Web. **DevOps:** AWS SDK, Terraform, OpenStack.

PROFESSIONAL SOFTWARE DEVELOPMENT

Senior Software Engineer (Promoted to Senior in 2014)
Cefalo AS, October 2012 – August 2015
Responsibilities:

- Designed and developed a content synchronizer service named Mediator that exchanges digital print media contents from one content management system to another. Technologies: Java, Apache Karaf, Apache Camel, Google Guice, Spring MVC, MongoDB, AngularJS, jQuery, Ionic, and more.
- Designed and developed Escenic Content Engine integration with Saplo, a news data mining service.

Software Engineer
Relisource INC, September 2010 – September 2012
Responsibilities:

- Developed and optimized a service-oriented iPhone application to monitor and analyze data of a US-based cold chain company. Used technologies are Objective-C and C#.
- Designed and developed a bug-free daemon appointment scheduling application for Mac OS using Objective-C. Hudson was used for test automation and nightly builds.
- Designed and developed an iPhone application for cold storage sensor data using Apple's BLE technology.

Software Engineer
REVE Systems, January 2010 – August 2010
Responsibilities:

- Research & development of VoIP based Mobile Dialer applications for iPhone using Objective-C and Xcode.
- Doubled performance of the voice codecs such as – g729, and AMR written in **C/C++,** and Java.