Rajib Dey | Curriculum Vitae

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Education

- **University of Central Florida** — **Orlando, Florida**
  Master of Science in Computer Engineering | CGPA : 3.88/4 — *2020 Fall*
- **American International University-Bangladesh** — **Dhaka, Bangladesh**
  Bachelor of Science in Electrical and Electronics Engineering — *2010–2014*

Technical skills

- **Programming Languages:** Python(Django, Networkx, NumPy, SciPy, Pandas, Matplotlib, Scapy), Bash, Micropython, SQL, Javascript, Java, C, C++, TeX and Assembly.
- **Tools:** Visual Studio Code, PyCharm, Eclipse, Android Studio, Autodesk Fusion 360, Git, Arduino IDE, Proteus, Gnuradio, MATLAB, Microsoft Office, Visio.
- **OS:** Linux, Windows, Mongoose OS, Amazon AWS.
- **Training Experience:** CCNA Routing and Switching Certification Course, 2014-15 | Certificate

Work Experience

- **Qualcomm** — **San Diego, CA**
  System Test Engineer — *Auguest 2021 –Current*
  Working as an Engineer at the Automotive Testing Department. Duties include: Writing automated test cases for various Software products using Python that leverages existing automation framework. Creating different tools to help the automation process of testing, logging and documentation of those tests. Debugging software/hardware issues during manual testing, suggesting changes, file bug reports using Jira. Collaborating with engineers across different teams to solve issues.

- **Circuitronics LLC** — **Sanford, Florida**
  Firmware Developer — *May 2019–August 2019*
  Developed firmware for a cloud-connected IoT device using Micropython on Digi Xbee3 NB-IoT module. The device is capable of sending sensor data from remote locations to a server intermittently for an expected lifetime of 5-7 years using two 3.7V AA size battery. Implemented OTA updates of the firmware and the configurations that does not require any kind of physical interaction. Helped in designing and debugging the Daughterboard which contains all the auxiliary circuitry necessary for sensor interfaces and controls of the whole the unit. Implemented basic server side code to test the whole system. This product is available commercially in the US | Product Link

- **University of Central Florida** — **Orlando, Florida**
  Graduate Research Assistant — *August 2016–Present*
  1. Research work on Security in Bluetooth Low Energy, resulting in discovery of major flaws in BLE security in all mobile and desktop operating systems. Android Security team has rated this finding as having "High Severity" | Paper | arXiv Link
  2. Research work on system on chip microcontrollers (ESP32, ESP8266 etc) used for various Internet of Things(IoT) application, resulting in a research paper on bench-marking their efficiency. | Paper | IEEE Link
  3. Designed printed circuit board (PCB) and 3D printed cover to commercialize a secure PM2.5 Sensor.
  4. Research work on Software Defined Radio (SDR) using a modified TV Tuner, resulting in a Secure Spectrum Sensor using MQTT Protocol. Which sends RSSI values of a radio frequency in a particular location to a server live, along with the coordinates of that location. This radio frequency range can be controlled live from the server/controller side via secure TCP connection. For security, certificate based TLS communication for MQTT have been implemented. | Language: Python | Code

- **University of Central Florida** — **Orlando, Florida**
  Graduate Teaching Assistant — *August 2016–Present*
  1. Grading and assisting student project for the course Foundations of HCI (CAP3104) consisting of 146 students.
  2. Created and graded assignments/quizzes of 65+ students and helped them understand the content better for the course Embedded Systems (EEL 4742), Engineering Analysis and Computation (EGN 3211) and Digital Systems (EEE 3342).
  3. Taught Electronics 1 Lab (EEE 3307) with n=35, Intro to C (COP 3223) with n=70+, Systems Software (COP 3402) with n=222 resulting in almost 100% of the students getting an A.

Relevant Projects

- Regularly practice my coding skills on websites like Hackerrank.com. My codes are available on my Github.
- Wrote a program which, if given the truth-table, can output the circuit and vice-versa. Here, circuits contain only boolean resistors with only high or low values. Algorithms used: Equivalent resistance calculation, Breadth-First-Search(BFS), Boolean Algebra etc | Language: Python | Code
- Implemented Greedy Algorithm to solve an Interval scheduling problem. Compared the efficiency of the algorithm with the brute-force method | Language: Python | Code
- Wrote a web-page which lets users do LU Matrix decomposition | Language: Javascript | Code | Website
- Simulated a Preferential Deletion Model Network of 50 thousand nodes based on a research paper. Plotted the growth of the number of nodes, edges and cumulative degree distribution of the network depending on different probability of the nodes being added or removed | Language: Python | Code
- Given the location data of 1000 cars, three vehicle tracking/position estimation techniques have been implemented and their performance is evaluated in a lossy communication link with varying packet error rates for Crash Warning Algorithm. | Language: Matlab | Code
- *'Reconstruction of a signal after pre-filtering through a low-pass Butterworth filter'* | Language: Matlab | Code
- *'Designing an Overflowed Buffer'* | Language: C | Code
- *'Send Manual Spam e-mail using telnet'* | Language: bash | Code
- *'Internet worm propagation simulation'* | Language: Java | Code
- Research paper on: *'Security Vulnerabilities in Bluetooth Low Energy'* | Paper
- Senior Design Project:*'Design and Implementation of Water Pump automation system'* | Language: C | Code

Research Papers

Book Chapters

1. Yue Zhang, Jian Weng, **Rajib Dey**, Xinwen Fu. "Bluetooth Low Energy (BLE) Security and Privacy", Encyclopedia of Wireless Networks 2019 | DOI | PDF

Conference Papers

1. Yue Zhang, Jian Weng, **Rajib Dey**, Yier Jin, Zhiqiang Lin, and Xinwen Fu. "Breaking Secure Pairing of Bluetooth Low Energy Using Downgrade Attacks" | Usenix Security 2020 | PDF
2. **Rajib Dey**, Sayma Sultana, Afsaneh Razi, and Pamela Wisniewski. "Exploring Smart Home Device Use by Airbnb Hosts", Conference on Human Factors in Computing Systems LBW (CHI 2020), 25-30 April, Honolulu, Hawaii, USA | ACM-DL | PDF
3. Yue Zhang, Jian Weng, **Rajib Dey**, Yier Jin, Zhiqiang Lin, Xinwen Fu. "On the (In)security of Bluetooth Low Energy One-Way Secure Connections Only Mode" | arXiv | PDF
4. Bryan Pearson, Lan Luo, Yue Zhang, **Rajib Dey**, Zhen Ling, Mostafa Bassiouni and Xinwen Fu. "On Misconception of Hardware and Cost in IoT Security and Privacy" , IEEE International Conference on Communications (ICC), 20-24 May 2019 - Shanghai, China | IEEE | PDF

Awards and Services

1. UCF-SGA travel grant, May 2019.| Funding – UCF SGA
2. Instructor at Camp-Connect at UCF, Jun 2018. | Details
3. Reviewer for IEEE ICICS 2018. | Conference link