

# HESSAM MOHAMMADMORADI

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Work Authorization: U.S Permanent Resident

## EDUCATION

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- 2013-Present      PhD in Computer Science, Expected graduation Dec 2018  
University of Houston, Computer Science Department, Houston, TX  
Under Supervision of Prof. Omprakash Gnawali  
GPA: 3.72/4
- 2010-2013        M.Sc. in Information Technology Engineering  
Sharif University of Technology, Computer Engineering Department, Tehran, Iran  
GPA: 3.95/4
- 2006–2010        B.Sc. in Information Technology Engineering  
University of Tehran, Electrical and Computer Engineering Department, Tehran, Iran  
GPA: 3.6/4

## EXPERTISE

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**Wireless Sensing & Communication:** Experience with IEEE 802.15.4, Ultrawide Band (UWB), Wireless Sensing, Mesh Networks, Location Aware MAC and Routing Protocols, BLE Mesh Networks

**IoT Application Design:** Designed and Deployed IoT Applications like Room Occupancy Estimation, Image Processing, Smart Home Energy Management, Indoor Localization and Navigation, Safety Management on Construction Sites

## PROFESSIONAL/RESEARCH EXPERIENCE

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- 08/2013–Present    **Research Assistant, Networked Systems Laboratory, CS Department, University of Houston**
- Design, deploy and measure performance of wireless network protocols
  - Develop sensing applications and analyze collected data
  - Build innovative IoT applications utilizing sensing technologies
  - Mentor graduate and undergraduate students
- 07/2017-12/2017    **Research Scientist Intern, Philips Lighting Research North America, Cambridge, MA, USA**
- Design and Implemented UWB mesh network using OpenThread standard
  - Developed 3D indoor localization system using DW1000 UWB chips
  - Implemented 3D indoor human tracking web interface using WebGL technology
- 07/2016 -10/2016    **Research Scientist Intern, Robert Bosch LLC, Pittsburgh, PA, USA**
- Design and implemented People Counting solution using IR array sensors
  - Investigated thermal noise patterns inside buildings

- 06/2011 - 09/2013 **Software Designer and Developer, FANAP, ICT Subsidiary of Pasargad Financial Group**
- Developed object oriented web based insurance solution (10,000 users, Java)
  - Experienced UML Design, Agile Development, Database Administration, Software Testing and Report Design
  - Engineered product requirement analysis process via monthly meetings with clients
- 05/2010-09/2010 **Summer Intern, Multimedia Systems Laboratory, ECE Department, University of Tehran**
- Participated in group project was aimed to implement and improve H.264 video encoding standard using C++ language
  - Improved bit rate adaptation efficiency by 10% for H.264 encoding over high loss rate network connections

## COMPUTER SKILLS

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**Languages:** Java (10,000 LOC), C, C++, Python, PHP, UML etc.

**Database and Client/Server Technologies:** Oracle (SQL, PL/SQL), MSSQL, MySQL, Apache and Microsoft IIS

**Software Tools:** NS2, Wireshark, Modelsim, CVS, SVN

## PUBLICATIONS

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- Spring 2018 **Hessam Mohammadmoradi, Omprakash Gnawali, Kyungiki Kim, “UWB-based Single Anchor Localization Using Reflected Multipath Components”, Submitted to DCOSS’18**
- Model statistical characteristics of Multipath Reflected Components in UWB Signals
  - Generate location fingerprints based on Reflected Multipath Components
  - Propose Single Anchor Localization based on UWB Fingerprinting
- Spring 2018 Milad Heydariaan, **Hessam Mohammadmoradi, Omprakash Gnawali, “Toward Standard Non Line of Sight Benchmarking of Ultrawide-band Radio-based Localization”, Submitted to IEEE CPSBench’18**
- Investigate impact of different materials on propagation of UWB signals
  - Provide guidelines toward standardization of NLoS benchmarking in UWB localization
- Fall 2017 **Hessam Mohammadmoradi, Omprakash Gnawali, David Moss, Rainer Boelzle, Gene Wang, “Effect of a Task-based Residential Energy Efficiency Program in Oahu”, In Proceedings of the Fifth Conference on Sustainable Internet and ICT for Sustainability (SustianIT’17), Dec 2017, Fanchal, Portugal, Best Paper Award Winner**
- Evaluate the effectiveness of simple guideline-based energy saving programs
  - Extract patterns in energy consumption among the program’s participants
- Spring 2017 **Hessam Mohammadmoradi, Shengrong Yin, Omprakash Gnawali, “Room Occupancy Estimation Through WiFi, UWB, and Light Sensors Mounted on Doorways”, In Proceedings of International Conference on Smart Digital Environment (ICSDE’17), July 2017, Moraco.**
- Utilize CSI information from 802.11n devices to count entrance and exit events through the door
  - Utilize CIR information from 802.15.4 devices to count entrance and exit events through the door
  - Utilize light sensing to count entrance and exit events through the door
- Fall 2016 **Hessam Mohammadmoradi, Sirajum Munir, Omprakash Gnawali, Charles Shelton, “Measuring PeopleFlow through doorways using easy-to-install IR Array Sensors”, In Proceedings of the International Conference of Distributed Computing in Sensor Systems (DCOSS’17), June 2017, Ottawa, Canada**
- Utilized 8\*8 array sensor to estimate room occupancy
  - Developed OpenCV C++ solutions to analyze IR images and extract human body information
  - Studied thermal noise patterns inside the room to improve people counting solution accuracy
  - Developed an Android application to collect body temperature from Microsoft Band2

- Fall 2016 **Hessam Mohammadmoradi**, Omprakash Gnawali, Alex Szalay, “**Accurately Initializing Real Time Clocks to Provide Synchronized Time in Sensor Networks**”, In Proceedings of the International Conference on Computing, Networking, and Communication (ICNC’17), Jan 2017, CA, USA
- Designed wired and wireless techniques to accurately initialize real time clocks in WSNs.
  - Deployed and verified accuracy of proposed approach in real data collection environment
- Spring 2016 **Hessam Mohammadmoradi**, Omprakash Gnawali, David Moss, Rainer Boelzle “**Poster Abstract: Impact of Engagement in Efficiency of Energy Saving Programs**”, In Proceedings of the ACM/IEEE Information Processing in Sensor Networks (IPSN 2016), Vienna, Austria, April 2016
- Designed Energy Saving Program which includes 12 activities, a mobile app and a smart plug
  - Conducted experiment with 740 participants in Oahu, Hawaii
  - Measured Effectiveness of Participant’s Engagement in Program
- Fall 2015 **Hessam Mohammadmoradi**, Omprakash Gnawali, “**USB Malware Detection by Utilizing USB Usage Patterns**”, Houston Security Day Workshop, Houston, Texas, USA, October 2015.
- Developed a light-weight script to collect information about plugged in USB devices (Java)
  - Collected data for more than one year form 60 desktop computers (Academic Lab)
  - Extracted USB device usage pattern based on the collected data
- Fall 2014 **Hessam Mohammadmroadi**, Nir Rattner, Omprakash Gnawali, Andreas Terzis, Alex Szalay, “ **Poster Abstract: Robust Time Synchronization in Wireless Sensor Networks Using Real Time Clock**”, In Proceedings of the ACM Conference on Embedded Networked Sensor Systems (SenSys 2014), Memphis, Tennessee, USA, November 2014.
- Configured an external real time clock as sensor mote’s clock reference
  - Built and deployed time synchronized sensor network
  - Investigated harsh deployment impacts on time synchronization performance

## LEADERSHIP, PROFESSIONAL ACTIVITIES AND AWARDS

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- Awarded Best Paper Award at SustainIT 2017 Conference, Portugal, Dec 2017.
- Selected as fellow member for TMC BioDesign Fellowship, Houston, Tx, 2017, Acceptance Rate: 1.6%
- Recognized as Best Technical Solution, TMC BioDesign Hackathon, Houston, Tx, April, 2017.
- Awarded Best Poster Presentation at Houston Security Day Workshop, University of Houston, October 2015
- Awarded Graduate Tuition Fellowship, University of Houston, Fall 2013
- Served as program committee member in ACM IPSN 2015 Shadow PC
- Awarded ACM SenSys 2015 Travel Grant (1000\$)
- Awarded IEEE MASS 2015 Travel Grant (800\$)
- Ranked top 10% in graduation class of 2013, Sharif University of Technology, Iran
- Elected as Vice President for University of Houston Iranian Community (UHIC), Spring 2015 - Spring 2016

## REFERENCES

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Prof. Omprakash Gnawali, Assistant Professor, Computer Science Department, University of Houston, [gnawali@cs.uh.edu](mailto:gnawali@cs.uh.edu)  
 Dr. Sirajum Munir, Research Scientist, Robert Bosch LLC, North America Research Center, [sirajum.munir@us.bosch.com](mailto:sirajum.munir@us.bosch.com)  
 Dr. Dan Jiang, Senior Research Scientist, Philips Lighting Research, North America, [dan.jiang@philips.com](mailto:dan.jiang@philips.com)

## KEYWORDS

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Distributed systems, Protocol and network design, Sensor networks, Big Data Analysis, Embedded Software Design, Real Time Systems, Time Synchronization Protocols, Java, C, C++, PHP, MySQL, Database, Software Development, Telecommunication, UML, SVN, ASP, TCP/IP, OpenThread, 6lowpan, Mesh Networks, RIOT, Embedded OS.