HARSHA GANEGODA

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EMBEDDED ENGINEER

Experienced (over 8 years) Embedded Systems Engineer with expertise in embedded systems development, specializing in C, C++ programming. Passionate about driving innovation in space technologies and next-generation wearable health solutions with a strong background in the full software development lifecycle, including designing, developing, and testing robust embedded systems. Excel in dynamic environments, managing multiple priorities independently while maintaining a focus on delivering efficient, high-performance solutions. A team-oriented professional, with excellent verbal and written communication skills, and adaptability in tackling new challenges.

KEYWORDS

Wearable Monitoring, Wireless Body Area Network, Bio Signal Processing, Telemedicine, NASA In Space Manufacturing, Space Health Monitoring, Cryptography, Power Analysis Attacks, Data Security, Security Protocols, Jira, Embedded Software Design, Real Time Systems, RTOS, FreeRTOS, Java Script, GitHub, React, C, C++, Python, Windows, Linux, Software Development, TCP/IP, MQTT, Azure, AWS, Google Cloud, 3D Printed Electronics, Next Generation Wearables, Docker, Bitbucket, Confluence, Yocto, BSP, Embedded Linux, SPI, I2C, I2S, UART, RS-485, RS-232, BLE, Wi-Fi, IMU, Barometer, GPS/GLONASS, ECG, Protobuf, Jira, Agile Development, Ansible, GitLab, Jenkins, Real Time Systems Integration, DOORS, Flight Simulators, Flight Deck Displays, Embedded Systems, Firmware for Microcontrollers

EDUCATION

2018-2020 **The University of Alabama in Huntsville, AL, United States**
Master of Science in Computer Engineering
Thesis: An Implementation of the Wireless Body Area Network of Synchronized Inertial Sensors for Balance Testing

2011–2015 **University of Peradeniya, Sri Lanka**
Bachelor of Science in Computer Engineering

PROFESSIONAL/RESEARCH EXPERIENCE

02/2023–Present **Realtime Software Engineer – Flight Deck Displays, The Boeing Company**, Seattle, WA

- Developing simulated flight deck displays for Boeing commercial airplanes
  - 777X, 777, 787, 737 Max programs
- Experience in Model-Based design and, multiple Boeing flight simulators
- Working on Boeing's future flight deck programs

08/2021–02/2023 **Embedded Linux Engineer, Eurotech, Inc**, Madison, AL

- Developed embedded Linux Distributions, support packages, and device drivers using Yocto for ARM/x86 products and developed embedded Linux tools to support IoT gateways

12/2019–07/2021 **Embedded Design Engineer, Firia, Inc**, Madison, AL

- Developed and implemented next generation wearable devices and telemedicine systems for healthcare applications.
- Developed and implemented IoT based embedded systems such as cloud connected door locks and emergency light.
- Developed Linux based system applications.
- Designed electronic hardware circuits, Schematic drawing and PCB designing.
- Designed Web based device firmware update utility

- Designed and implemented Raspberry Pi based test station for flashing firmware during mass production.

08/2018-12/2019 **Research Assistant, NASA Marshall Space Flight Center,** Huntsville, AL

- Designed and implemented a smart flexible wireless multi-sensor wearable device to monitor respiration and CO2 of Astronauts.
- The developed smart flexible wireless multi-sensor wearable device is successfully being used for monitoring astronaut crew health at the NASA Johnson Space Center in Houston.
- Evaluated and designed space and applicable technologies for extremely low power embedded sensing and communication platforms suitable for implementation on 3D printed substrates.

08/2018-12/2019 **Graduate Research Assistant, Department of Electrical and Computer Engineering, The University of Alabama in Huntsville,** Huntsville, AL

- Designed and developed wireless body area network for human posture balance testing
- Designed wireless sensor network including smartwatch/smartphone applications to acquire vitals and biomedical signals and designed IoT based smart home environment for assisted living facility.
- Designed and implemented a wireless body sensor network for PPG based non-invasive blood presuure estimation.
- Designed and developed a FPGA based hardware platform which is charged based non-invasive stimulation to modulate physiological state of the user

11/2016-11/2017 **Embedded Engineer, Atlas Labs**, Colombo, Sri Lanka (Australian startup)

- Designed electronic cattle tag powered by solar, based on low power TI microprocessor with RF core which is used to transmit data such as cattle's movements, location, and environment data.

10/2015-11/2016 **Research and Development Engineer, Multirotor Unmanned Aerial Vehicle Laboratory, CodeGen International**, Sri Lanka

- Designed and developed fully autonomous quadcopter which has ability to auto takeoff, auto landing, and waypoint navigation.

10/2014-03/2015 **Industrial Internship, IBM**, Colombo, Sri Lanka

- Experienced in IBM System X hardware/software installation technical support services.

TECHNICAL SKILLS

Operating Systems : Microsoft Windows, Linux variants
Languages : C, C++, Python, JavaScript, Shell Script
PCB Design : Eagle CAD, Ki-CAD
Signal Processing : MATLAB and Simulink
Model-Based Design : VAPS XT
Network Protocols : TCP/IP, MQTT
Sensor Interfacing : I2C, SPI, UART, I2S, RS-485, RS-232
Cloud/Virtualization : Microsoft Azure, Google Cloud Platform, Docker
GUI Design : Android Studio, React, Qt Creator, Processing
3D Printed Electronics : Voltera V-One
Project Management : Atlassian Jira & Confluence, Agile Development
Version Control & CI/CD: Bitbucket, GitHub, GitLab, Jenkins
Other : Soldering

HONORS AND AWARDS

- **Stair Climbing Robot** - 2nd place in ROBOChamps 2014, robotics competition organized by Robotics society University of Peradeniya
- Silver Award in SLIIT ROBOFEST 2014, all national robotics competition organized by Electrical & Computer Engineering, Department of Sri Lanka Institute of Information Technology

NON-RELATED REFEREES

Dr. Emil Jovanov
Professor,
Department of Electrical and Computer Engineering
The University of Alabama in Huntsville
Huntsville, AL 35899
Email: emil.jovanov@uah.edu

Curtis W. Hill
Senior Materials Engineer & Subject Matter Expert,
In Space Manufacturing Project Lead, On Demand Manufacturing of Electronics
NASA Marshal Space Flight Center
Email: curtis.w.hill@nasa.gov

PUBLICATIONS

2020 **Long Term Monitoring of Respiration and CO2 using Flexible Printed Sensors –** IEEE Aerospace Conference in 2020

- Proposed and implemented an idea of monitoring respiration and CO2 of Astronauts using smart flexible printed sensors.
- This project was granted by NASA Marshall Space Flight Center, Huntsville as a part of NASA ISM (In Space Manufacturing) program.

2020 **An Implementation of the Wireless Body Area Network of Synchronize Inertial Sensors for Balance Testing –** Master Thesis

- Proposed and developed the system to automate balance testing using multiple synchronized sensors.
- The system consists of smartphone with custom application, two wireless sensor nodes, smartwatch with a custom application, and a home server. End of each balance test, results are automatically sent to the remote computer.

2019 **Development of an Automated 30 Second Chair Stand Test using Smartwatch Application –** 41st Annual International Conference of IEEE Engineering in Medicine & Biology Society

- Developed a smartwatch-based interface to automated CDC (Centers for Disease Control and Prevention) recommend 30 Second Chair Stand Test.

2019 **IoT Based Longitudinal Monitoring of Activity and Posture Transitions in Smart Homes –** IEEE SoutheastCon

- Designed and implemented smart home environment which can be used to monitor posture transitions. This enables new opportunities for assisted living facilities.

2017 **Breaking Speck Cryptosystem using Correlation Power Analysis Attack –** Journal of the National Science Foundation of Sri Lanka

- Showed for the first time that a newly introduced light weight cypher called Speck by NSA (National Security Agency) is vulnerable to power analysis attack.
- Practically analyzed the effectiveness of existing countermeasures and did improvements.

2015 **Testbed for Power Analysis Attack Based on the Arduino Prototyping Board–** Proceedings of the Peradeniya University International Research Sessions (iPURSE), University of Peradeniya, Sri Lanka in 2015.

2015 **The A to Z of Building a Testbed for Power Analysis Attacks –** 10th IEEE International Conference on Industrial and Information Systems (ICIIS) in 2015.

- Created a customizable and easy to use testbed for power analysis attacks which can be break AES in 10 minutes.