# RIA GHOSH

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## Objective

Seeking **PhD** Internship in Hardware and Embedded System Design Engineering to implement my evolving and up to date technical skill set in Programming, Analysis, Optimization and design-based applications.

## Professional Experience

**3M- Corporate Research Systems Lab (CRSL)** **Minneapolis, Minnesota**
Research & Development Intern- Digital Solutions Group (**Summer 2019, 2020**)

- Developed an optimized microphone array with the Digital Systems Group and MModal
- Collaborated with Amazon Web services to generate customized voice-control features for 3M products
- Microphone array testing along with Alexa skills and Lambda function programming for prototypes
- DVT, FCC and ESD testing for Industrial Safety Equipment
- 3D Vision-control using advanced simultaneous localization, mapping or depth sensing capabilities

**Cochlear Implant Processing Laboratory-Center for Robust Speech Systems** **Dallas, Texas**
Research Assistant- firmware and Hardware Development (**September 2018-Present**)

- Design and Development of a Portable CNN/DNN Smart-Space Environment Classifier and Real-time Transcriber for Cochlear Implant and Hearing aid users.
- Establishing a Cloud-based audio analytical engine and user-feedback system to aid research in the field of hearing impairment.
- Incorporate BIST with wireless networking strategies for non-clinical trials and testing of cochlear implants
- Dissertation thesis outline- https://drive.google.com/file/d/1AohaP50Y58Z2VuAtSzTxW24X4RM2UCPf/view?usp=sharing

**LOCOMOTOR SYSTEM CONTROL LABORATORY** **Dallas, Texas**
Embedded System Controls Engineer (**April 2018-August 2018**)

- Designed actuator drive system for precise control of Exoskeleton and Prosthetic Leg parts using sensors, Bluetooth, SPI, I2C and CAN
- Finalized the BOM for components and design of custom-made PCB for peripherals of the C2000 micro-controller

**QUALITY OF LIFE TECHNOLOGY LABORATORY** **Dallas, Texas**
Research Engineer (**September 2017- March 2018**)

- VHDL based FPGA prototype for a Heart Arrhythmia Detection and classification system in wearable devices
- Performed RTL level simulation, optimizing and verification of design flow with worst-case input test data to analyze accuracy

**TECH EDVENTURES(CURRICULUM PRACTICAL TRAINING)** **Dallas, Texas**
Intern-Engineering Design and Implementation (**September 2017-December 2017**)

- Implementing Pilot Drone Design, Embedded Controller Hardware Design, Robotic Car Design using Arduino, C++ and Verilog on OEM boards and Genuine MKR1000.
- Ensuring prevention and correction of Technical issues, Testing machines and measurement systems.

## Education

**The University of Texas at Dallas, Richardson, TX** Expected **Dec 2021**
**PhD** in Computer Engineering Current **GPA-3.6/4.0**
Master of Science in Computer Engineering Graduated **August 2018**

**Bhilai Institute of Technology, Durg, India** Graduated **May 2016**
Bachelor of Engineering, Electronics and Telecommunication GPA-8.99/10

## Core Competence and Skills

**Languages-** C, C++, Python, Verilog, VHDL, MATLAB, System Verilog, Java, Perl Scripting
**Software**: JavaScript, ECLIPSE, Microsoft Office (Advanced Excel), Cadence, XILINX, MODELSIM, SPICE, Synopsys
**Hardware Tools:** FPGA programming, PCB Design, KiCAD, Altium, SolidWorks, AutoCAD

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## Publications

1. **Ghosh, R.**, Hansen, J.H., and Charan, M.R., 2020, July. "Portable Smart-Space Research Interface to Predetermine Environment Acoustics for Cochlear implant and Hearing aid users with CCi-MOBILE". (accepted) In *2020, 42nd Annual International Conference of IEEE Engineering in Medicine and Biology Society, July 20-24.*
2. Mamun, N., **Ghosh, R.**, and Hansen, J.H., 2019. Quantifying Cochlear Implant Users' Ability for Speaker Identification using CI Auditory Stimuli. *arXiv preprint arXiv:1908.00031, IEEE INTERSPEECH 2019, Graz, Austria.*
3. **Ghosh, R**., Hansen, J.H., Ali, H., Saba, J.N., Charan, M.R., Mamun, N. and Brueggeman, A., 2019, May. CCi-mobile: Design and evaluation of a cochlear implant and hearing aid research platform for speech scientists and engineers. In *2019 IEEE EMBS International Conference on Biomedical & Health Informatics (BHI)* (pp. 1-4). IEEE.
4. **Ghosh, R**., Hansen, J.H., Ali, H., Saba, J.N., Charan, M.R., Mamun, N. and Brueggeman, A., 2019 July. CCi-Mobile: Moving Towards Exploring Advanced Research Paradigms for Cochlear Implant and Hearing Aid Users. *Conference on Implantable Auditory Prostheses (CIAP), Lake Tahoe, California, USA*
5. **Ghosh, Ria,** Gowtami, P. and Mishra, S.D. (2016). Design and Analysis of a maximum length 5-Bit Parallel Linear Feedback Shift Register using VHDL Structural Modeling. *International Journal of Innovative Research in Computer and Communication Engineering. 4 (4),6750-6757.*

## Academic Projects

**Implementation and Testing of Heart Disease Detection Algorithm on FPGA** **September-2017-May 2018**

- Aiming towards a Master's with thesis degree, this research work revolves around designing an efficient MATLAB code from planned algorithm, then convert to VHDL for burning and Test on an FPGA.

**Instruction Level Parallelism of DES Algorithm to improve the Design Architecture** **June-2017**

- Coded the DES algorithm in VHDL and C, then modify it to enhance performance, reduce Delay and power used specifically using Loop unrolling, hardware and software pipelining.

**Live Data Analysis of the Temperature Variation in a Temperature Measuring IC using Arduino** **April- 2017**

- Created a visualization report and dashboard in Power BI using Azure Stream Analytic to upload live temperature variations from Arduino programmed temperature IC to a Data Lake via creation of IoT hub.

**Design and Analysis of Performance of Arbiter & Butterfly PUFs through implementation on FPGA February-2017**

- Compared the architecture, power and accuracy of giving non- deterministic outputs of Physically Unclonable Functions which can analyzed after the Place and Route simulation in Xilinx.

**Wireless Power Transfer Circuit Design** **December,2016**

- Designed a two-part design with basic electrical components, of which the Transmitter circuit was for wireless voltage generation and the receiver circuit consisted of a receiver coil, rectifier, and regulator. The design was simulated in SPICE circuit simulator and would be useful to charge device like pacemakers.

**Building an Effective Batch Language Processor in a LINUX operating system** **October 2016**

- Built a tool that parses and executes a Batch File containing number of commands using XML and JAVA Programming.

## Workshops and Extra-Curricular

1. Twice Best Speaker at District Level Toastmasters International and President of JSOM Friday Toastmasters.
2. Volunteer for the Leukemia and Lymphoma Society, Dallas since December 2016.
3. Agile-based web development and UI-designs is a part time hobby.
4. Currently trying out easy basic Android game designs to understand game development.
5. Data Science with Python Workshop 10th June to 6th August 2017, University of Texas at Dallas.
6. Big Data Club Workshop, 25th June to 7th August,2017, University of Texas at Dallas.