

# Aishwarya Lekshmi Chithra

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## EDUCATION

**University of Wisconsin-Madison** Dec 2022 (Expected)  
*Master of Science in Electrical and Computer Engineering : Research* GPA:3.86/4  
Teaching Assistant : Digital System Fundamentals (Spring 2021), Introduction to Computer Engineering (Summer 2021).

**Birla Institute of Technology and Science, Pilani, India** 2017  
*Bachelor of Engineering (Hons.) Electronics and Instrumentation Engineering* GPA:8.3/10

## SKILLS

**Coursework:** Digital Design, Microprocessor Programming and Interfacing, Computer Architecture, Machine Learning  
**Languages & Scripting:** Verilog (Proficient), System Verilog (Proficient), C (Intermediate), C++ (Intermediate), OpenCL, TCL, x86 Assembly Language, Shell, Makefile, Python  
**Design Software:** Xilinx Vivado, HLS, Vitis, QuestaSim, ModelSim, MATLAB  
**Tools & Platforms:** Git, Jira, Perforce, Linux, Windows

## RESEARCH

**Wisconsin Embedded Systems and Computing Lab, UW Madison**  
*Advisor - Prof. Younghyun Kim* Jan 2021 - Present

- Design and integrate custom accelerators with a lightweight RISC-V core to implement a System on Chip for HumanActivity Recognition (HAR).

## WORK EXPERIENCE

**Xilinx** Hyderabad, India  
*Design Engineer 2* June 2017 - Dec 2020

- Implemented high throughput FIPS 197 compliant AES encryption IP, supporting XTS, ECB and CFB modes in Verilog, targeted for use in high performance FPGA acceleration cards in Data Center applications.
- Analyzed and identified bottlenecks in AES hardware implementation by profiling and **improved the performance by 50%**.
- Validated RFC 1951 compliant GZIP, ZLIB Compression IP in Verilog using standard benchmark datasets (Silesia, Canterbury and Calgary) for Data Center applications. Optimized the validation system and **reduced the resource consumption by 50%**.
- Enhanced the performance of applications by offloading the compute intensive operations to FPGA using the Xilinx SDAccel tool and validated using Amazon Web Services (AWS) EC2 F1 FPGA platform.
- Verified and validated SHA-3 Secure Hashing IP Core compliant with NIST FIPS-202. **Identified bugs**, which facilitated a successful release of the IP.
- Developed test libraries and ran test applications for end-to-end system integration and validation of SmartSSD, a Computational Storage Device in U.2 form factor co-developed by Xilinx and Samsung. **Automated the validation flow**, which helped identify design bugs early in the production cycle.

**Tonbo Imaging** Bangalore, India  
*Embedded Engineering Intern* Jan 2017 - May 2017

- Validated the video processing software application for configuring audio/video capture data flow of the Thermal Imaging Camera, Foxhound, on DM365 DaVinci Digital Media Processor.
- Offloaded the CPU-intensive task of displaying the On-Screen Display (OSD) components of the Thermal Imaging Camera to hardware using framebuffer to **reduce the CPU usage by 60%**.

## PROJECTS

**Design and Simulation of RISC based Processor** Mar 2021 - Apr 2021

- Designed and simulated a 16-bit 5 stage in-order pipelined processor in Verilog with Direct Mapped and Set Associative write back Cache.
- Designed a hazard detector to resolve RAW dependencies through stalls.

**Eyeball tracking system for controlling mouse pointer** Jun 2016 - Jun 2016

- Incorporated Viola-Jones face detection algorithm and Circular Hough transform for eyeball tracking in real time to control a mouse pointer, in MATLAB.

**Automatic Speaker Recognition and Text to Speech Synthesis** Nov 2015 - Dec 2015

- Developed a system to extract unique vocal parameters from a voice sample and recognize the speaker from a database using MATLAB.

## PUBLICATIONS

**A Novel Adiabatic SRAM Design Using Two Level Adiabatic Logic** July 2016

- Designed two SRAM blocks using Two Level Adiabatic Logic to improve the power consumption by a factor of 8 compared to a conventional SRAM.
- Authored, published and presented the paper at the 15th Biennial Conference on Electronics and Embedded Systems held in Tallinn, Estonia in 2016.

## HONORS & ACTIVITIES

- Awarded INSPIRE (Innovation in Science Pursuit for Inspired Research) scholarship, from the Department of Science and Technology of India, 2013.
- Volunteer at Udayan Shalini Program, a mentorship program for underprivileged girls in Hyderabad.