THE UNIVERSITY OF UTAH

2025-2026
List of Senior Projects

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Laboratory of CIRCUITS & SYSTEMS (LCAS)
THE UNIVERSITY OF UTAH

List

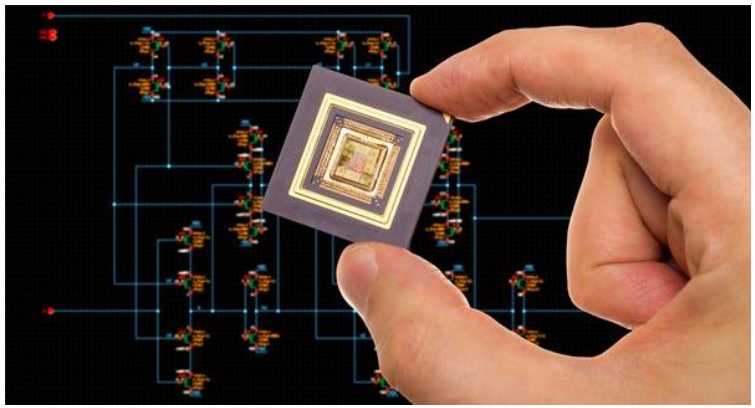
List of Projects

- Analog Design Automation
- Neural Network Emulation
- PCB Design and Analog Chip Testing

Project Descriptions

Analog Design Automation

- **Description:** Analog circuits are critical components in modern communications and computing systems. Analog circuits are widely used even in modern digital processors, enabling higher performance and lower energy consumption. This project aims to develop algorithms and libraries required to automatize the design of basic analog circuits using a methodology developed here at the University of Utah. The developed algorithms will be published and shared as open-source tools for public usage.
- **Skills learned:** Students will learn about analog IC design and verification.
- **Prerequisites:** Students need to be highly motivated and needs to have knowledge on the fundamentals of analog and circuits. Proficiency with Python or another scripting language is necessary. Knowledge of device physics is also preferred. Minimum course requirements are ECE 3110. ECE 5720 is also preferred.
- **Contact:** Michael Keyser, michael.keyser@utah.edu. Farzad Ordubadi, farzad.ordubadi@utah.edu Office: MEB 1254.



Machine Learning
Automated Neural Network Emulator

- **Description:** This project builds on existing work to develop an automated framework to quickly deploy and test different neural networks on an FPGA to simulate the performance of a neural network implemented in an integrated circuit (IC). Students will build a software to take existing state of the art neural networks, modify their behavior to simulate the effects observed when implementing in an IC, deploy and test the network on an FPGA, and automate the process to be both dataset and network agonistic.
- **Skills learned:** Students will become proficient in using the Zedboard FPGA (and its accompanying software Vivado) and developing high-level software to interface with the FPGA.
- **Prerequisites:** CE students are preferred. Students needs to have prior programming and FGPA experience. Preferred minimum course requirements would be ECE 3710 and CS 4400 (or equivalent programming experience).
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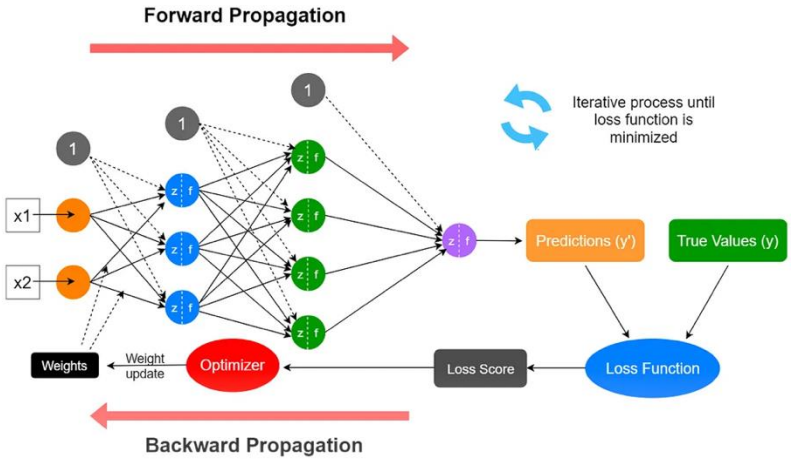
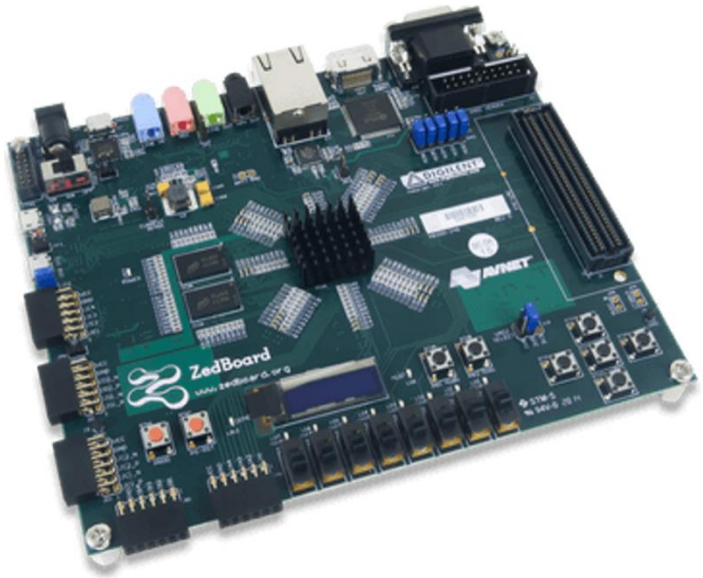
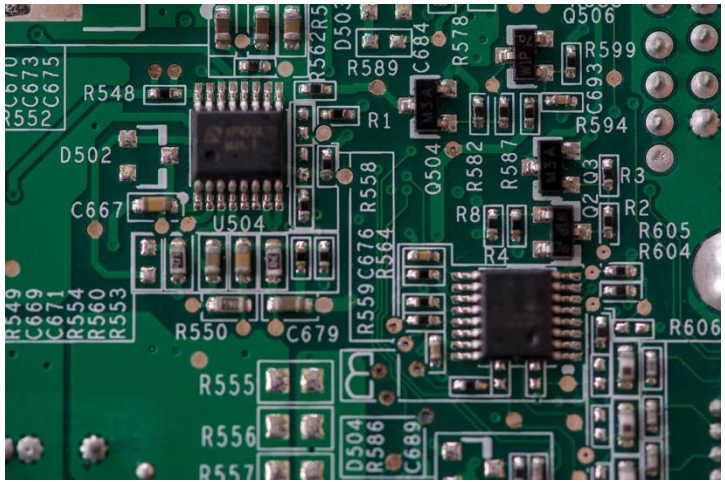
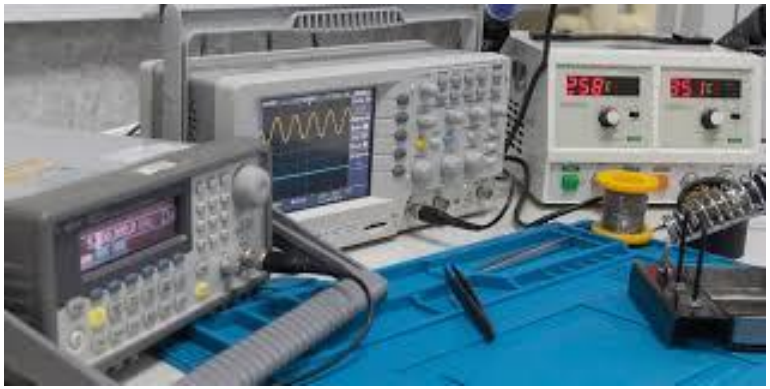


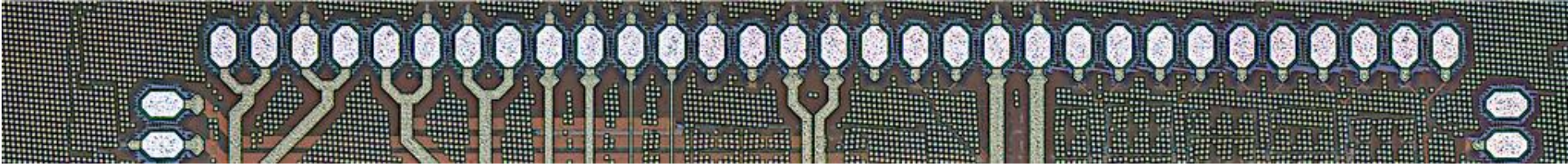


PCB Design and Analog Chip Testing

- **Description:** This project develops a PCB and tests custom integrated analog circuits and ADCs designed by the LCAS team. In addition to designing and soldering the PCB, students will develop scripts to automate the collection and post-processing of measurement data. Students will use both software (e.g., MATLAB, python) and an FPGA for data post-processing.
- **Skills learned:** Students will become proficient in PCB design and IC testing. Additionally, students will become proficient in post-processing measurement data.
- **Prerequisites:** Students need to have prior experience designing PCBs and a strong circuits background. Students also need to be comfortable writing code, programming FPGAs, and have strong math/data processing skills.
- **Contact:** Michael Keyser: michael.keyser@utah.edu, Farzad Ordubadi: farzad.ordubadi@utah.edu Office: MEB 1254.







LCAS Employs Advance Signal Processing, Communications, and Coding For Extreme High Performance & Energy Efficient Circuit Design

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