



# Hello MIDI

# SDSU

College of Engineering  
Electrical and  
Computer  
Engineering

# MIDI Interfacing LED Piano Instructor

## Project Overview

The “Hello MIDI” is an attachment to a piano with Musical Instrument Digital Interface (MIDI) configuration that aims to educate the user through Light Emitting Diode (LED) illumination. This process is done through the user utilizing the Liquid Crystal Display (LCD) screen and selecting a game mode and song that then will interact with code that would light up an LED attached to a piano note to signal which note to play. Accuracy is displayed through a flash of red and green to denote whether the correct note was played or not.

## Specifications

- 61 bi-color LEDs @ 60 mA per ( $60 \text{ mA} \times 61 = 3.66 \text{ A @ } 5 \text{ V}$ )
- Two-row LCD screen with buttons for mode and song selection ( $\approx 70 \text{ mA}$ )
- MIDI input port for live piano signal input with optocoupler for circuit isolation
- Integrated speaker for sound response
- Custom shift register circuit for bi-color LED control

## Team Introduction



Miguel Dariano  
Electrical Engineering



Anabel Sanchez  
Computer Engineering



Robert Masotti  
Computer Engineering



Emily Berkness  
Electrical Engineering

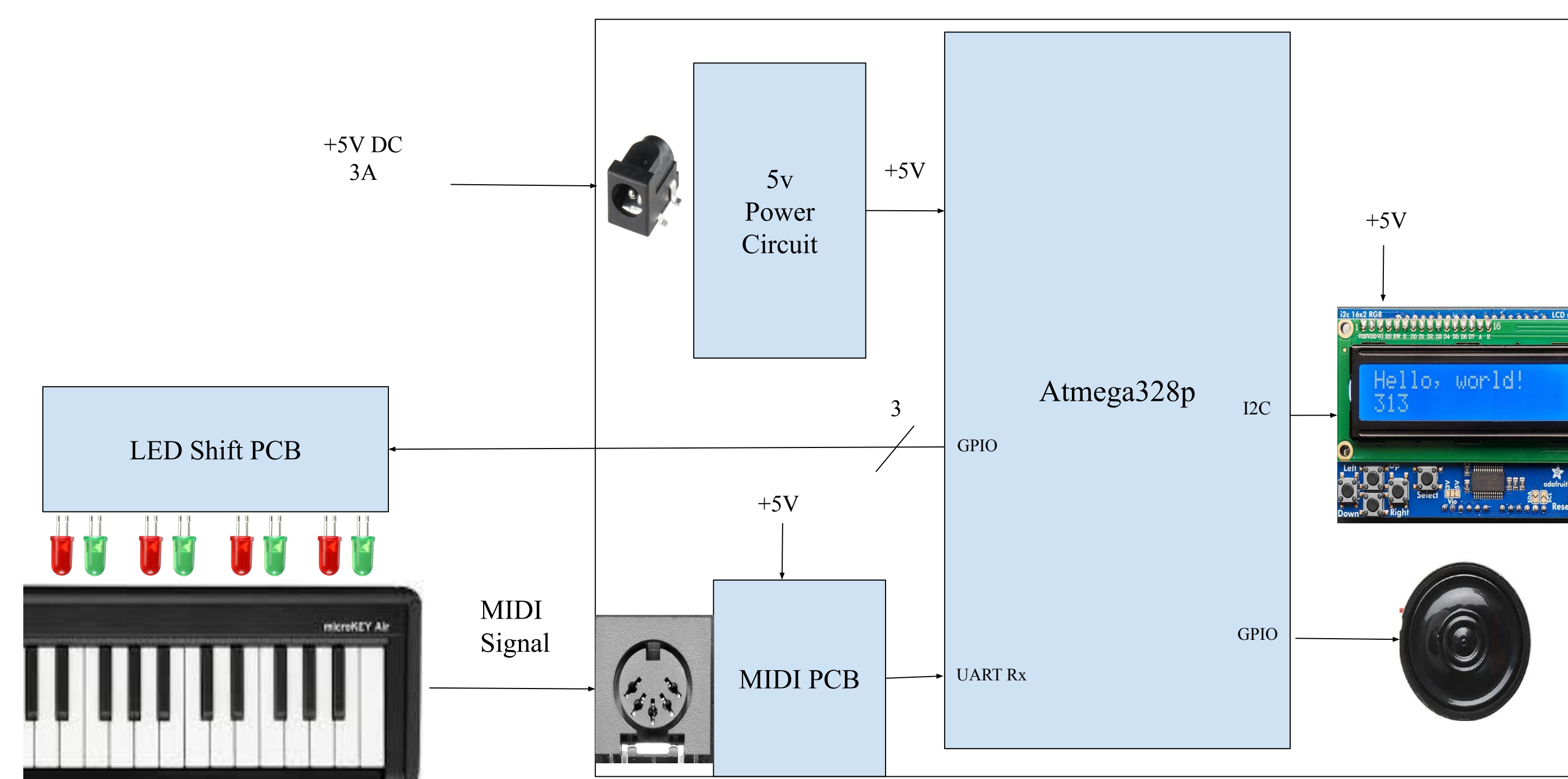


Alvaro Lopez  
Electrical Engineering

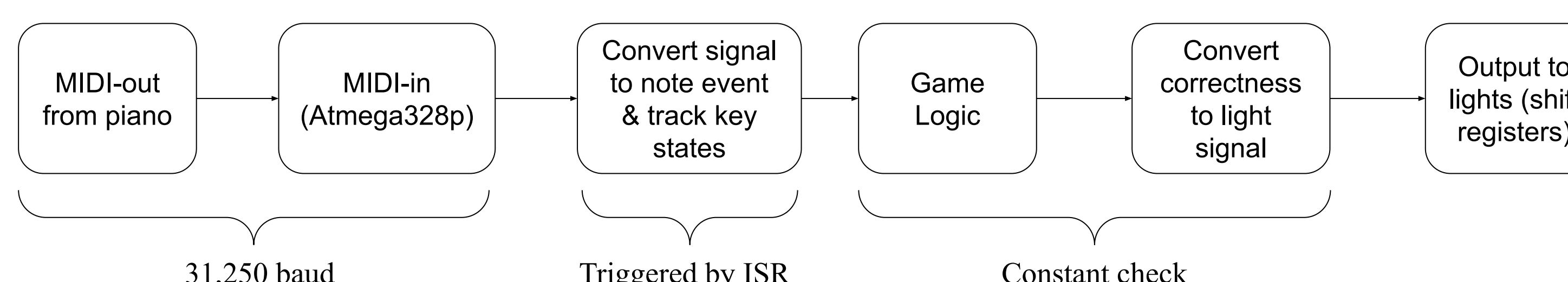


Dr. Scott Lipscomb  
Faculty Advisor

## System Block Diagram



## System Flow Diagram



## Key Technologies

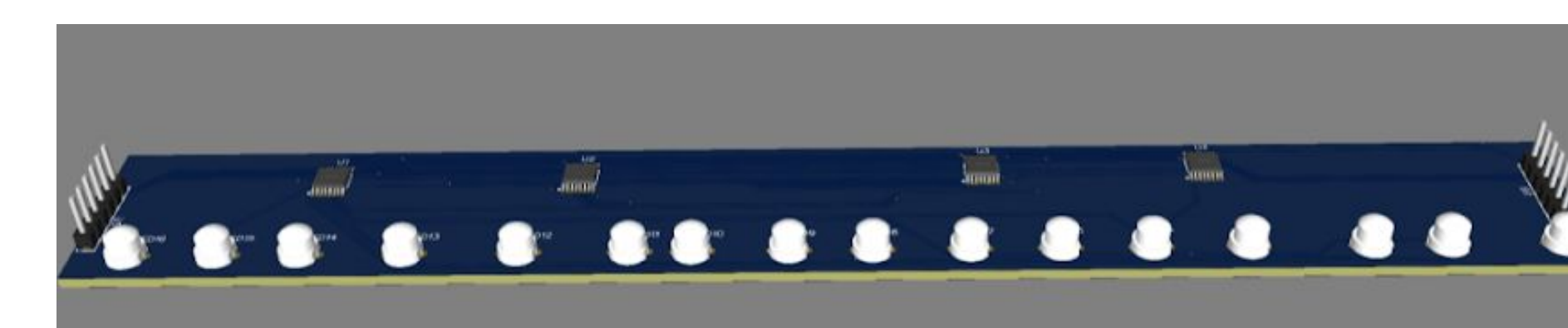
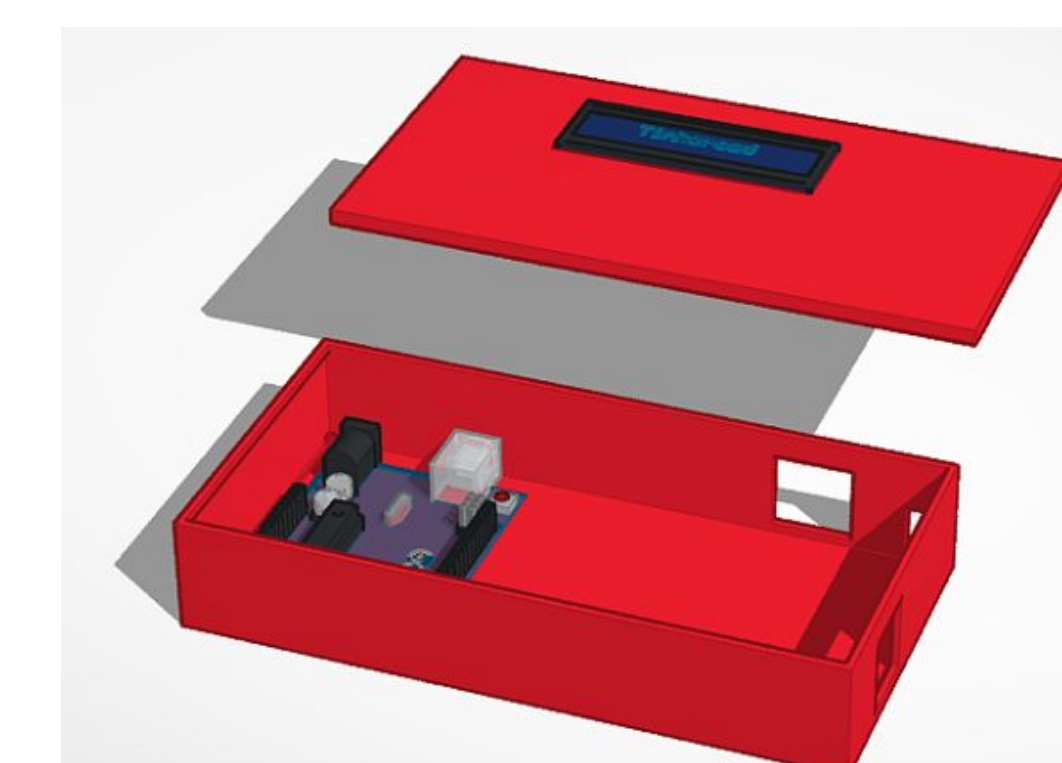
Procured:

- Microcontroller (Atmega328p)
- ICs: optocoper, shift registers
- I<sup>2</sup>C display and buttons
- Speaker unit

Developed:

- MIDI communication PCB
- LED shift register PCB
- Embedded software
- Housing

## Hardware Prototype



## Final Project

