

# Alex Elliott

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## EDUCATION

**California Polytechnic State University, San Luis Obispo**  
Master of Science in Electrical Engineering  
Bachelor of Science in Electrical Engineering

GPA: 3.91  
June 2025  
June 2024

## PROJECTS

**Master's Thesis: "Nonlinear Integral Control Schemes for a Cadence-Heartrate Process"** Jan 2025 – June 2025

- Researched nonlinear control methods building on findings from another student's thesis
- Derived nonlinear control system that gives the user a cadence signal to drive their heartrate to within a desired range
- Incorporated a nonlinear cadence-heartrate plant model for the human cardiovascular system's response to exercise
- Used MATLAB Simulink to simulate the response of the human plant to various control system designs

**Digital Audio Synthesizer**

Sep 2023 – June 2024

- Designed an audio synthesizer based on the STM32F746G discovery board, integrating multiple external components
- Implemented oscillators, filters, envelopes, LFOs, and other effects using digital-signal processing (DSP) in C language
- Programmed handlers for MIDI input, I2C communication with Adafruit's encoder boards, and the WM8994 DAC

**Lightshow Synchronized to Music**

Dec 2016 – Present

- Built multiple (~8) lighting controllers from ESP8266 microcontrollers and programmed with Arduino IDE to receive DMX data over Wi-Fi via sACN (e1.31) protocol from Vixen Lights and Falcon Pi Player software and interface with various types of lighting elements, including relay-controlled string lights, WS2812b LEDs, and P10 LED panels
- Designed, soldered, and built lighting elements such as "leaping arches" and a "Mega-Tree" using WS2812b LEDs

## WORK EXPERIENCE

**Audio Visual Tech II**

June 2022 – July 2025

Associated Students Inc., Cal Poly | San Luis Obispo, CA | Part Time (~15 hrs/wk)

- Set-up and operated audio-visual equipment (microphones, audio, projection, displays, lighting) for clients' events
- Communicated with clients to determine their audio-visual needs and acted as primary AV Tech at assigned events
- Trained new Techs, created "one-sheet" manuals and training videos for lighting control systems, maintained and repaired AV equipment, and "troubleshoot" and resolved issues as they arose

**Audio Visual Student Assistant (Tech I)**

Oct 2021 – June 2022

Associated Students Inc., Cal Poly | San Luis Obispo, CA | Part Time (~10 hrs/wk)

**Service Production Coordinator**

Feb 2019 – Oct 2022

The Rock of Roseville | Roseville, CA | Part Time (~6 hrs/wk)

## RELEVANT COURSEWORK

Electric Circuit Analysis  
Signals and Systems  
Digital Logic Design  
Classical Control Systems  
Control Systems Theory  
Stochastic Processes  
Electromagnetic Fields and Waves  
Intro. to Communication Systems  
Semiconductor Device Electronics  
Electronic Design  
Advanced VLSI Design  
Analog Filter Design  
Computational Intelligence

Electronics Manufacturing and Circuit Analysis Laboratory  
Digital Signal Processing  
Computer Design and Assembly Language Programming  
Digital Control Systems  
Advanced Topics in Automatic Control  
Industrial Power Control and Automation  
Energy Conversion and Electromagnetics  
Digital and Analog Electronics and Integrated Circuits  
Microcontroller-Based Systems Design  
Music Technology: Recording, Synthesis, and Production  
Computer-Aided Design of VLSI Devices  
Discrete-Time Filters

## SKILLS

Arduino IDE	Audio Mixing	Audio-Visual Tech	Control Expert PLC/PAC Software
C/C++ Programming	Client Communication	Keysight ADS	KiCad PCB Design
Lab Equipment Usage	Lighting Design	Linux OS	LTSpice Circuit Simulation
MATLAB & Simulink	Microsoft Word	Microsoft Excel	Oscilloscope Usage
Prototyping & Soldering	STM32Cube IDE	Verilog/SystemVerilog	Xilinx Vivado
3D Printing			