Christopher J. Barr

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EDUCATION

University of Nevada, Las Vegas   Fall 2014 to expected Spring 2020
Bachelor of Science in Computer Engineering | Senior Undergrad | Overall GPA: 3.28

ENGINEERING PROJECTS

CMOS 4x Clock Multiplier   Fall 2019
- Designed a circuit that takes a 9-11 MHz, 50% duty cycle, clock signal and generates a 36-44 MHz clock signal
- Used multiple inverters with multitudes of widths/lengths as well as a XOR gates and buffers
- Created a layout to DRC and LVS the schematic for it to be ready for fabrication under the MOSIS design rules

CMOS Boost Switching Power Supply (SPS)   Fall 2019
- Designed a power supply using the On Semiconductor's C5 process with both on-chip and off-chip devices
- The device is designed to intake a *VDD* varying from 3.75V to 5.25V and outputting a voltage of 7.5V, all while keeping power usage to a low
- The Boost SPS contains a bandgap for reference voltage, a comparator using 3 diff-amps, an oscillator of 70% DC, and a buffer to drive a 1000/1 NMOS integrated switching device

32x32 APD Camera System (Software)   Summer 2019
- Worked in an eight-person team; led the software design aspect
- Used C++ code to an Atmega328PB microcontroller using AVR Studios 7.1
- Received an input of 32x32 decoded pixels into an ADC, running at 16MHz, with values containing either 0 to 255 black/white color scale. These values are then projected onto a terminal, using USART, to store these values onto a text file

FM Transmitter   Summer 2019
- Using a dead bug style of soldering, the device could transmit an FM frequency from ranges of 88MHz to 108 MHz
- The device took a mono audio input and the signal was received through an FM receiver
- The circuit was analyzed and tested though a spectral analyzer

MIPS Superscalar Pipeline Processor   Spring 2019
- Designed using Verilog code, simulated and verified through ModelSim
- The device is designed to take in MIPS instructions and go through 5 stages of pipeline in the order of fetch, decode, execute, memory, and writeback stages. The end goal was to take two lines of instructions, as oppose to one, to increase execution time

Digital Security Lock System – Junior Design Project   Spring 2018
- Worked in a two-person team; led the software design aspect
- Used the NIOS 2 soft processor to display the locks status using RGB colors, and through VGA output
- Designed a lock control system inputting a DC value into the 12V actuator to open or close the lock
- Designed to open and close based on a 4-bit user inputted code and was also user resettable

Battery Voltage Monitor   Spring 2018
- Used a potentiometer and LED breakdown voltage, the device would receive and monitor a 12V DC battery
- The red LED turned on when input voltage exceeded 13.5V. The green LED turned on when the input voltage dropped below 10.5V

"Soccer_Blocker" Video Game – Junior Design Project   Spring 2017
- Used C code to project an image at a 50MHz refresh rate
- Used pushbuttons to control the images located on the monitor from the VGA PINS
- Pushbuttons moved the block to catch randomly generated smaller blocks to increase the score

WORK EXPERIENCE

NIAS (Nevada Institute for Autonomous Systems) Intern   December 2019 – Present
Switch, NV
- Learned to fly drones, schedule drone flights with ATC (air traffic control), understood classes of airspaces

Undergraduate Research Assistant   March 2019 – Present
UNLV Student Union Las Vegas, NV
- Collaborate with graduate/undergraduate students to complete team-based projects. Assisted with microcontroller encoding, as well as testing PCB boards. Wire bonded chips using the K&S 4526 Manual Wire Bonder as well as normal soldering practices with through hole and surface mounted PCB's. Cadence layouts for chip designs

Conference Housing Team Member   April – August 2015 & April – August 2016
Event Services Manager & Team Member   August 2015 – January 2017
UNLV Student Union Las Vegas, NV
- Set up rooms for on-campus events for clients, and maintained guest rooms
- Plan and log tasks, processed payments
- Managed teams of 2-4

Cashman Photo Enterprise, Thrill Photographer   June 2013 – August 2013
New York New York, NV
- Captured photos of tourists for the roller coaster ride

RELEVANT COURSEWORK

Computer Science	Synthesis and Verification	Operating Systems/Data Structures
Digital Logic Design	Analog/Digital Electronics Design	VLSI
Dig. System Architecture & Design	Embedded Systems	High-Speed PCB Design

TECHNICAL SKILLS

Programming Languages: C++, C, VHDL, System Verilog, Verilog, AVR assembly, MIPS assembly, LTSpice Netlists
Software/Tools: Active-HDL, LTSpice, Quartus 7.1/13.1, ModelSim 13.1, Atmel Studio 7, Microsoft Office, OpenSCAD, Code Composer Studio 9.1, MARS MIPS, Eagle PCB Design, Cadence Virtuoso (EDA), Cadence Spectre, TowerJazz (EDA)
Platforms: Windows, Linux, Mac OS
Electronics: Circuit Building, Circuit Designing, Digital Logic Design, Soldering (surface mount/through hole), Microcontrollers, FPGA, K&S 4526 Manual Wire Bonder, Spectral Analyzer, Oscilloscope, Power Supply, Multimeter