James W. Skelly

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Education

Stanford University PhD Admit, Starting September 2022

PhD Advisor: Dr. Kwabena Boahen

University of Nevada, Las Vegas, 2020-2021

Master of Science in Electrical and Computer Engineering

University of Nevada, Las Vegas, 2016-2020

Bachelor of Science in Electrical Engineering

Honors: Magna Cum Laude (GPA: 3.96/4.00)

Research

- **Graduate Research Assistant in an integrated circuit design/testing research group supervised by Dr. R. Jacob Baker at UNLV.**
    - **Publication 1:** Vikas Vinayaka, Sachin P. Namboodiri, Shadden Abdalla, Bryan Kerstetter, Francisco Mata-Carlos, Daniel Senda, **James Skelly,** Angsuman Roy, R. Jacob Baker. 2019. Monolithic 8x8 SiPM with 4-bit Current-Mode Flash ADC with Tunable Dynamic Range. In GLSVLSI '19: 2019 Great Lakes Symposium on VLSI, May 9-11, 2019, Tysons Corner, VA, USA. ACM, New York, NY, USA, 6 pages. https://doi.org/10.1145/3299874.3318005
    - **Publication 2:** S. P. Namboodiri, G. Arteaga, **J. Skelly**, F. Mata-carlos, A. Roy and R. J. Baker, "A Current-Mode Photon Counting Circuit for Long- Range LiDAR Applications," *2020 IEEE 63rd International Midwest Symposium on Circuits and Systems (MWSCAS)*, 2020, pp. 146-149, doi: 10.1109/MWSCAS48704.2020.9184584.
    - **IC design, layout, tape out** using C5, AMS, TowerJazz processes in Cadence.
    - **PCB design** for ICs designed in the lab and other lab projects.
    - **Soldering** through-hole, SMD components by hand, as well as reflow soldering.
    - **Programming microcontrollers** for various embedded systems projects.

Other Work Experience

- **Electrical Engineering Intern** at Vorpal Research Systems, a laser and electro-optical system design and manufacturing company. (Spring 2019 – Fall 2020)
- **Electrical Engineering Intern** at Pololu Robotics and Electronics, design and test voltage regulators, motor drivers, controllers. (Fall 2021)
- **Intellectual Property Technical Consultant**
    - **Covington & Burling LLP (Palo Alto, CA and Washington, DC)**
        - Case 1 – Phenix (sic) Longhorn, LLC v. *Texas Instruments, Inc.*
            - Case Number - Texas, ED (Marshall) 2:18-cv-00020. Complaint filed on January 22, 2018.
            - Case Subject Matter – Circuit with non-volatile memory for gamma correction in a display screen.
            - Work Performed – Provided expert consulting services including reviewing schematics and other case materials.
        - Case 2 – Bell Semiconductor, LLC v. *Texas Instruments, Inc.*
            - Case Number – Texas, ED 2:20-cv-00048
            - Case Subject Matter – Package drawing files using cutouts to reduce parasitic capacitance on high-speed pins.
            - Work Performed – Reviewed package drawing files and categorized package designs.
    - **DLA Piper (East Palo Alto, CA)**
        - Case – Invensas Corporation and Tessera Advanced Technologies, Inc. v. *NVIDIA Corporation*
            - Case Number – Delaware, 1:19-cv-00861. Complaint filed on May 8, 2019.
            - Case Subject Matter – Reference voltage circuits (programmable bandgaps) having a substantially zero temperature coefficient using bipolar and MOS transistors.
            - Work Performed – Provided expert consulting services including reviewing schematics and other case materials.
- **Grader** for various electrical and computer engineering courses (Spring 2020 – Spring 2021)
- **Math Tutor –** tutored 6 high school and undergraduate level students in a variety of mathematics courses including (high school) algebra I, algebra II, geometry, (college) pre-calculus, calculus I, II, III. (Fall 2016 – Spring 2019)
- **Textbook Reviewer** for *CMOS Circuit Design, Layout, and Simulation, Fourth Edition* – R. Jacob Baker.

Projects

Individual

- **Bluetooth Low Energy Module Breakout Board:** Designed a breakout board for the HM-10, HM-11 BLE modules with on-board buck-boost SPS. PIC18LF26K22 MCU is used to send data serially to the BLE module and to configure settings on the module. MCU programmed in C using MPLAB. System can be connected to Android apps.
- **Force Sensing Mechanism with Amplified Output:** Designed a PCB containing a small force sensor with analog output voltage and an instrumentation amplifier. Entire unit is comprised of two PCBs connected by pogo pins for spring action.
- **Manually Operable Scoreboard:** Designed a 9" by 15" fully functional scoreboard for various sports using an ATmega328P MCU programmed in C.
- **Darkness Sensor:** Designed, programmed, and built PCB containing ATMEGA328P MCU and a photoresistor divider to sense when the undergraduate lab is dark and hit the switch turning the lights back on using DC push-type solenoids. MCU programmed in C.
- **PIC Microcontroller Breakout Board:** Designed a breakout board for the QFP44 PIC18LF46K22 microcontroller including convenient PICkit3 programming pins, female header ports for each IO pin, indicator LEDs for programming and power, and a UART port breaking out the TX and RX pins.
- **CMOS Boost Switching Power Supply:** Designed, simulated, and laid out a Boost SPS IC for varying temperature (0 to 100 degrees Celsius) and power supply voltage ($3.75V \leq VDD \leq 4.75V$) with a fixed 5V DC output reference voltage.
- **555 Timer Christmas Tree Ornament:** Designed a PCB to be used as an ornament in the shape of a Christmas tree using a 555 timer and powered by a 9V battery. The ornament has flashing and solid modes, and the flashing frequency can be adjusted by the on-board easily accessible potentiometer. No programming necessary.
- **CMOS High-Speed Transimpedance Amplifier:** Designed and simulated a transimpedance amplifier using differential amplifiers to convert light from an avalanche photodiode into a voltage output.
- **CMOS Low Voltage, High Gain Op-Amp:** Designed and simulated an op-amp with Gain Bandwidth Product over 1 MHz, capable of operating over a wide power supply range ($2V \leq VDD \leq 6V$).
- **CMOS Serial-to-Parallel Data Converter:** Designed, simulated, and laid out 8-bit Serial-to-Parallel data converter in Cadence's C5 process.
- **CMOS Low-Power Voltage Amplifier:** Designed, simulated, and tested (on breadboard) a CMOS voltage amplifier with a gain of 10 which draws less than 1mA of current from a 9V power supply.
- **CMOS Full Adder:** Designed CMOS 8-bit full adder, performed logic simulation using transient analysis of digital signals, and laid out the circuit in Cadence's C5 process.

Group

- **Wireless Data Transmission System (Thesis):** Worked in a team of 2 to design a system (confidential) to extract data from sensors, process the data and transmit processed data wirelessly to a smartphone application for analysis. System was designed using HM-10 BLE module and PIC MCU, programmed in C using MPLAB.
- **Motor-Driven Laser Alignment Station (Senior Design):** Worked in a team of 2 to design a laser lens alignment station using programmable stepper motors and ball-screw linear actuators. GUI programmed using C# and beam modeling performed in MATLAB.
- **Alignment Station 3D Modeling:** Worked in a team of 2 to model each individual component of the laser alignment station and create a final assembly in SolidWorks.
- **Freedom Photonics IC Tape-out:** Worked in a team of 5 to tape out a 152-pin, 5mm x 5mm ASIC with on-chip current and voltage DACs, op-amps, LVDS channels, and other structures for a Freedom Photonics project. Cadence TowerJazz process was used.
- **Four Function Calculator:** Led a team of 2 in design of 8-bit four-function calculator, implemented on DE2 board. Wrote code for each function using Verilog, designed schematic.
- **Test Structures IC:** Worked in a team of 3 which designed IC containing logic gates (NAND, NOR, NOT), ring oscillator, voltage divider, MOSFETs, and boost SPS circuitry. Laid out in Cadence's C5 process and fabricated for testing.
- **CMOS Audio Amplifier:** Led a team of 2 in design, simulation, and testing of a CMOS audio amplifier using ZVN3306A and ZVP3306A transistors. Input is audio signal from iPhone audio jack, output on 22-ohm speaker.

Volunteering & Service Activities

- **Reach Our City** – Travel down to the Las Vegas Strip every other Wednesday to help give out 100 free Bibles, free waters, and pray with people walking by.
- **Calvary Downtown Outreach** – Volunteer at Calvary Downtown Outreach helping to feed homeless people in the downtown Las Vegas area.
- **F.E.A.T. (Families for Effective Autism Treatment) Picnic** – Volunteer at F.E.A.T. picnic manning game stations, giving out lunch, setup, and breakdown.
- **I.K.E.D. (Introduce a Kid to Engineering Day)** – Led different age groups of 15 or more children in creating a makeshift light spectrometer using cereal boxes and CDs, answered questions about engineering and college in general.
- **Panelist** on student panel for NSF Las Vegas Scholars' Program. (Summer 2019)

Leadership

- **Former President of Tau Beta Pi, NV Beta Chapter at UNLV:** Lead chapter (containing 845 total members) by planning of service events, delegating tasks to other officers, organizing and leading initiation and orientation ceremonies.
- **Teaching Assistant:** Lead group review and study sessions as a TA, as well as office hours for several electrical and computer engineering courses, including Digital Logic Design I, Mixed-Signal Circuit Design, Digital Electronics and Digital IC Design, Digital Electronics Lab, and Memory Circuit Design. (Spring 2020 – Spring 2021)
- **IEEE Workshop Leader:** Led PCB Design, Soldering, LTSpice workshops for students at UNLV who are pursuing degrees in electrical/computer engineering.
- **Event Manager at The Plaza, Whitney Ranch:** In charge of event setup and venue management, directing and managing caterers, bartenders, barbacks, DJs, and guests for over three years. (June 2015 – September 2018)
- **UNLV Intramural Basketball Team Captain** (Spring 2018 – Spring 2019)
- **Men's Slow-pitch Softball Team Coach/Captain** (Fall 2019, Spring 2021)

Honors/Awards

- UNLV Rebel Grad Slam 3-Minute Thesis Competition **Grand Prize Winner** (Fall 2021)
- Marjorie and Victor Kunkel Scholarship (Fall 2020 – Spring 2021)
- AEE Nevada Chapter 2020 Scholarship (Fall 2020 – Spring 2021)
- **Magna Cum Laude, Bachelor of Science in Engineering** (Spring 2020)
- Wolzinger Family Engineering Scholarship (Fall 2019 – Spring 2020)
- Gilman and Bartlett Engineering Scholarship (Fall 2018 – Spring 2019)
- Earl and Hazel Wilson Scholarship (Fall 2016 – May 2020)
- Valedictorian Scholarship (Fall 2016 – May 2020)
- Millennium Scholarship (Fall 2016 – May 2020)
- Robert Mars Principal Achievement Scholarship (Fall 2016 – Spring 2017)
- Howard R. Hughes College of Engineering Dean's Honor List (Fall 2016 – May 2020)
- Named to UNLV Intramural Basketball All-Star Team (Spring 2019)
- Back-to-back UNLV Intramural 3-Point Contest Champion (Fall 2020, Spring 2021)

Professional Associations

- **Member,** IEEE (Institute of Electrical and Electronics Engineers)
- **Member,** Tau Beta Pi (Engineering Honor Society) National Chapter