Camilo Tejeiro

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Relevant Skills *(In order of proficiency)*

Areas of Knowledge
Analog & Mixed-signal IC Design, RF IC Design, Discrete PCB Design, Embedded Systems, Firmware and Software.

Technical Skills
Synopsys (Custom, Compiler, Primesim, Hspice), Cadence Virtuoso (Spectre), SPICE, VerilogA, Linux, TCL, Verilog, Python, SHELL scripting, MATLAB, Altium Designer, Eagle, KiCad, C, LaTeX.

Personal Skills
English and Spanish Bilingual Proficiency, Team & people-oriented, Self-driven, Diligent, Perseverant.

Education

University of Toronto — Toronto, ON, Canada
Cumulative GPA — 3.94 on a 4.0 scale
M.A.Sc. Electrical and Computer Engineering — April 2020

Relevant IC Coursework

Integrated Circuits for Wireless Communications (ECE 1390), Analog Circuit Design I (ECE 1352), VLSI Design Methodology (ECE 1388), Analog & Mixed Signal Processing Circuits (ECE 1396), High Frequency Integrated Circuits (ECE 1365 – Audit), Advanced Analog Circuits (ECE 1371 – Audit), Digital Design for Systems on Chip (ECE 1373).

University of Washington — Seattle, WA, USA
Cumulative GPA — 3.54 on a 4.0 scale
Bachelor of Science in Electrical Engineering — June 2013

Relevant IC Coursework

Linear IC Design (EE 473), Analog Circuit Design (EE 433).

North Seattle Community College — Seattle, WA, USA
Cumulative GPA — 3.81 on a 4.0 scale
Associate of Science — June 2010

Peninsula College — Port Angeles, WA, USA
Cumulative GPA — 3.15 on a 4.0 scale
College Transfer — June 2009

Engineering Experience

Synopsys — Mississauga, ON, Canada
Sr. Analog & Mixed-signal Circuit Design Engineer — August 2020 - Present
Ownership of SerDes AMS blocksfor multiple projects fabricated in advanced sub-12nm technology nodes. Design of testbenches for functional verification and writing of measurement scripts for reporting of performance to meet specifications. *More details available on request.*

Intelligent Sensory Microsystems Laboratory — Toronto, ON, Canada
Research Assistant (Supervisor: Roman Genov) — January 2018 - April 2020
Development of wireless biomedical integrated circuits and systems, and flexible electrode interfaces for

implantable devices. Responsible for the design of ultra-low-area-and-power data transmitter RF-ICs and clock generation ICs. Participated in two group tapeouts in 65nm CMOS and contributed seven RFIC blocks to two ASICs developed at the laboratory. Also contributed to the design of ASIC application test board and interfacing boards, and collaborated with additional design/layout and PCB tasks to assist team efforts to meet tapeout and publication deadlines. *Projects' technical information available upon request.*

V-mode Edge-combining RO-based Power-scalable TX

RFIC Design – 65nm CMOS *Cadence Virtuoso IC Design Flow, 3 Fabricated IC Designs*
Design of three voltage-mode edge-combining ring-oscillator-based transmitters. The frequency-multiplying transmitters employ full OOK-power direct modulation and include support for: (1) Off-chip matching network and antenna, (2) on-chip tank and e-short antenna for short-distance communication and (3) built-in fixed clock prescaler respectively.

I-mode Stacked Edge-combining RO-based Current-reuse TX

RFIC Design – 65nm CMOS *Cadence Virtuoso IC Design Flow, 2 Fabricated IC Designs*
Design of two current-mode edge-combining ring-oscillator-based transmitters. The frequency-multiplying transmitters employ full OOK-power direct modulation and include support for: (1) off-chip matching network and antenna and (2) on-chip tank and e-short antenna for short-distance communication.

ULP Programmable Prescaler for High Division Ratios

Analog IC Design – 65nm CMOS *Cadence Virtuoso IC Design Flow, 2 Fabricated IC Designs*
Design of two ultra-low-power variable prescalers supporting high division ratios for low-frequency system clock generation. The prescalers include support for: (1) analog division ratio control and (2) digitally programmable integer division ratio control.

Microsystem Application Testboard

Embedded Systems, PCB Design *Altium Designer, 4 layers, 354 components*
Design of the group's test PCB based on application requirements for each ASIC block, including: DSP subsystem, AFE characterization and array channels, WPT and PMU subsystems, current stimulator and RF data transmitters; along with additional board supporting circuits.

Flexible Micro-electrode Arrays for In-vivo PNS Experiments

PCB Design *Altium Designer, 17 fabricated flex designs (V1,V2), 2 layers*
Design of custom flexible-polyimide implantable micro-electrode arrays (tripolar, tetrapolar and high-density designs) for peripheral nervous system experiments in different rodent animal models.

Depth Rigid-shank Electrodes for In-vivo CNS Experiments

PCB Design *Altium Designer, 5 fabricated rigid designs, 2 layers*
Design of custom single and dual-shank electrodes for depth implantation in the central nervous system of different rodent animal models.

Electrode Interfacing Boards Framework

PCB Design *Altium Designer, 8 fabricated rigid designs, 2 layers*
Design of interfacing assembly framework composed of: extender and conversion adapters, electrode breakout boards, flexible cabling assembly and high-retention connectors for enabling in-vivo testing of biomedical microsystem ASICs.

Ashima Devices Pasadena, CA, USA
Hardware/Firmware Design Engineer June 2014 - May 2015
Development of the sensor, communication and flight control hardware for the Hexpuck unmanned aerial device.

Li-Ion Active Battery Balancer Hardware Design

Analog Circuits, PCB Design *Eagle CAD, 4 layers, 176 components*
Design of a power management system for monitoring and efficiently balancing the cells on a Li-Ion battery to prolong flight lifetime.

Li-Ion Active Battery Balancer Embedded System

Firmware Development *C, Python, ARM-M0, Linux, GCC, GDB*

Design of the firmware state logic for battery monitoring, safety procedures, serial communication and active balancing control.

Flight Controller Daughter Board

Circuit Design, PCB Design *Eagle CAD, 48 components*

Development of a daughter circuit board for the flight controller to provide GPS positioning, WiFi communication and access to a single-board computer (for communication, image processing and computation heavy operations).

Motor ESC Hardware Design

Embedded Systems, Circuit Design *Eagle CAD*

Development of the embedded system architecture for efficiently controlling the speed of six brushless DC motors. Integration of the control, sense and driver circuitry into a complete device schematic.

Motor FET Driver Power Board

Circuit Design, PCB Design *Eagle CAD, 43 components*

Design of a power circuit board for driving a Brushless DC motor at high pulsed currents (rated at 40A per motor max) using a standalone 3 phase MOSFET driver.

Battery Simulator Hardware Design

Analog Circuits, PCB Design *Eagle CAD, 16 components*

Design of a stackable cell simulator circuit (constant voltage, variable current output) for creating battery stacks to safely test the active balancing circuit under different operating conditions.

Power Limiter Hardware Design

Analog Circuits, PCB Design *QUCS, Eagle CAD, 22 components*

Design of a simple analog circuit to place in series with a simulated battery stack to provide variable current settings while enforcing safe maximum power.

RGB Pixels Array Board

Circuit Design, PCB Design *Eagle CAD, 58 components*

Development of a programmable multicolor LED (pixels) display board for communicating alerts and messages while in flight.

Gyroscope Breakout Board

Circuit Design, PCB Design *Eagle CAD, 8 components*

Developed a simple circuit board for testing the functionality of an alternative gyroscope for the flight controller.

GPS Magnetometer Board

Circuit Design, PCB Design *Eagle CAD, 30 components*

Development of a printed circuit board for position and orientation purposes: integrating a commercial GPS module, a low noise amplifier, a ceramic patch antenna and a 3-axis digital compass into a single board.

Flight Controller Interface Board

Circuit Design, PCB Design *Eagle CAD, 10 components*

Development of an interface circuit board for the flight controller board to allow access to communication channels and hardware peripherals.

RTneuro Inc. Seattle, WA, USA

Lead Design Engineer July 2013 - May 2014

Design of the bio-medical sensors, the wireless embedded system and the communication software for the Rainbow wearable health device.

Wearable Wireless Health Device Hardware Design

Embedded Systems, PCB Design *Altium Designer, 4 layers, 92 components*

Design of the low power wireless embedded architecture and integration of all analog sensors and supporting circuitry into a complete high density circuit board.

Wearable Wireless Health Device Firmware Design

Embedded Systems, Firmware Development *C, ARM, KEIL*

Design and implementation of the firmware system logic, the sensors' interface and the wireless communication support (custom Bluetooth Low Energy service).

Low Power Reflectance Pulse Oximeter

Analog Circuits, PCB Design *Altium Designer, Multisim*

Design of a low power (low duty cycle) reflectance based pulse oximeter sensor (mixed signal and transistor level design), with software controllable light intensity and calibration support.

Bluetooth LE Router Application

Software Development *Java, Android API*

Design of a service based multi-threaded router application (Bluetooth Low Energy and Internet communication) with task-scheduling, inter process communication and error detection and handling.

Electromyography Sensor

Analog Circuits, PCB Design *Altium Designer, Multisim*

Design of a low power (shutdown support), low noise (instrumentation amplifier based topology) mixed signal electromyography sensor (measurement of muscles electrical activity) with software controllable gain and calibration support.

Galvanic Skin Response Sensor

Analog Circuits, PCB Design *Altium Designer, Multisim*

Implementation of a differential output, baseline adaptive (can adapt to multiple users) skin conductance sensor.

The Daniel Lab Seattle, WA, USA

Undergraduate Research Assistant January 2013 - March 2013

Development of a software application to aggregate gesture and myography data for control purposes.

EMG Hand Tracking and Gesture Recognition

Software Development *C++, Visual Studio*

Developed a system to enhance gesture recognition by integrating multiple sensory inputs from a depth camera and an electromyography sensor.

Spacelabs Healthcare Issaquah, WA, USA

Internship January 2012 - June 2012

Design of multiple software applications for monitoring patient health in a mobile environment and displaying health data in a remote graphical interface.

WiMM Watch Wireless Health Monitoring System

Software Development *Java, Android API, C#*

Developed a system that monitored blood pressure (Bluetooth sensor), pulse oxygenation (Bluetooth sensor) and user activity (Accelerometer) and transmitted possible health alerts and real time data to a remote server via TCP IP.

Neurobotics Laboratory Seattle, WA, USA

Undergraduate Research Assistant June 2011 - August 2011

Development of a manipulation experiment for researching feedback delivery techniques and design of a remote feedback device to help amputees.

Wireless EMG Actuated Prosthesis for Upper Limb Amputees

Analog Circuits, Firmware Development *C, MSP430, Multisim*

Designed a proof of concept wireless robotic manipulator actuated via electromyography with remote sensory feedback proportional to applied gripping force.

Wireless Vibrotactile Feedback Device

Embedded Systems, Firmware Development *C, MSP430*

Design of a low power wireless embedded system for integrating vibrotactile sensory feedback into low-cost prostheses.

Comparison of Remote Feedback Modalities for Prosthetic Hand Control

Embedded Systems

Implemented a pneumatic pressure feedback system, conducted virtual manipulation experiments and published a research paper on the findings.

Peninsula College Port Angeles, WA, USA

Undergraduate Research Assistant September 2008 - June 2009

Academic research for the development of physics applications.

Small Scale Low-energy Electron Linear Accelerator

Applied Physics

Implemented two voltage multipliers to establish the needed potential across the testing tube.

Publications

M. ElAnsary, J. Xu, J. Sales, G. Dutta, L. Long, **C. Tejeiro**, A. Shoukry, C. Tang, E. Kilinc, J. Joshi, P. Sabetian, S. Unger, J. Zariffa, P. Yoo, R. Genov, "Bidirectional Peripheral Nerve Interface With 64 Second-Order Opamp-Less $\Sigma\Delta$ ADCs and Fully Integrated Wireless Power/Data Transmission," in **IEEE Journal of Solid-State Circuits**, vol. 56, no. 11, pp. 3247-3262, Nov. 2021.

G. O'Leary, J. Xu, L. Long, J. Sales, **C. Tejeiro**, M. ElAnsary, C. Tang, H. Moradi, P. Shah, T. Valiante and R. Genov, "A Neuromorphic Multiplier-Less Bit-Serial Weight-Memory-Optimized 1024-Tree Brain-State Classifier and Neuromodulation SoC with an 8-Channel Noise-Shaping SAR ADC Array," in 2020 IEEE International Solid- State Circuits Conference - (**ISSCC**), Feb. 2020, pp. 402–404.

C. Tejeiro, C. E. Stepp, M. Malhotra, E. Rombokas, and Y. Matsuoka, "Comparison of remote pressure and vibrotactile feedback for prosthetic hand control," in 2012 4th IEEE RAS EMBS International Conference on Biomedical Robotics and Biomechatronics (**BioRob**), Jun. 2012, pp. 521–525.

Awards and Honors

University of Washington Quarter Dean's List March, 2013

Award received for maintaining a full time GPA of 3.50 or better during the winter quarter of 2013.

University of Washington Kaiser Aluminum Scholarship June, 2012

Scholarship awarded for good academic record and leadership potential.

University of Washington Annual Dean's List June, 2011

Award received for maintaining a full time GPA of 3.50 or better during the 2010-2011 academic year.

North Seattle Community College Merit Scholarship June, 2010

Scholarship awarded for academic excellence.

Leadership Experience

Osohm Inc. Torrance, CA, USA

Founder and Lead Design Engineer June 2015 - June 2016

Development of tools and applications to facilitate the widespread adoption of open technologies in the consumer market.

KipOpen Platform

Software Development *PHP, HTML, CSS, MySQL, Apache HTTP Server, Linux*
Design of a viable funding platform (business model) for open technology.

KipOpen Crawler and Search Server

Software Development *Nutch, Solr, Bash, Java, XML*
Open Implementation of a crawler, indexer and search engine for directing users to relevant information about open projects.

Android Quotes Display Apps

Software Development *Java, Android API*
Development of multiple Android applications to display personal/book quotes in a mobile device.

Water Filtration System

3D CAD Modeling *3D Printing, FreeCAD*
Designed a low cost, low maintenance water filtration system with a stackable architecture and multiple filtration stages.

SipText - Text Simple Planner

Software Development *Linux, Bash*
Designed a text based planner for everyday use.

Volunteer Experience

IEEE ISSCC Conference Student Volunteer February 2020
University of Toronto San Fransisco, CA, USA
Student volunteer for the 2020 International Solid State Circuits Conference.

IEEE ISSCC Conference Student Volunteer February 2019
University of Toronto San Fransisco, CA, USA
Student volunteer for the 2019 International Solid State Circuits Conference.

IEEE ISSCC Conference Student Volunteer February 2018
University of Toronto San Fransisco, CA, USA
Student volunteer for the 2018 International Solid State Circuits Conference.

STARS Tutoring Program April - June 2015
Lake Avenue Community Foundation Pasadena, CA, USA
Helped low-income middle and high school students complete their homework and succeed in classes.

IEEE IMS/RFIC Symposium Student Volunteer June 2013
University of Washington Seattle, WA, USA
Student volunteer for the 2013 International Microwave and Radio Frequency Integrated Circuits Symposiums.

Note-taker for Disability Resources for Students January 2011 - December 2011
University of Washington Seattle, WA, USA
Volunteered as a note-taker for electrical engineering students with disabilities.

Teaching Experience

Engineering Strategies and Practice Tutorial TA (APS 111, 112) Fall 2019, Winter 2020
University of Toronto Toronto, ON, Canada
Conducted weekly tutorials for class groups of 30 students as well as marking assignments (for course APS111 in fall and APS112 in the winter semester).

Memberships

Tau Beta Pi Engineering Honor Society April 2011 - June 2013

Society of Hispanic Professional Engineers September 2009 - June 2013