

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 (UDE), Cadence Virtuoso (Spectre), SPICE, VerilogA, Linux, TCL, Verilog, Python, SHELL scripting, MATLAB, Altium Designer, Eagle, KiCad, C, L^AT_EX.

Personal Skills

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

Education

University of Toronto

Cumulative GPA

M.A.Sc. Electrical and Computer Engineering

Toronto, ON, Canada

3.94 on a 4.0 scale

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

Cumulative GPA

Bachelor of Science in Electrical Engineering

Seattle, WA, USA

3.54 on a 4.0 scale

June 2013

Relevant IC Coursework

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

North Seattle Community College

Cumulative GPA

Associate of Science

Seattle, WA, USA

3.81 on a 4.0 scale

June 2010

Peninsula College

Cumulative GPA

College Transfer

Port Angeles, WA, USA

3.15 on a 4.0 scale

June 2009

Engineering Experience

Synopsys

Sr. Analog & Mixed-signal Circuit Design Engineer

Mississauga, ON, Canada

August 2020 - Present

Intelligent Sensory Microsystems Laboratory

Research Assistant (Supervisor: Roman Genov)

Toronto, ON, Canada

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

Undergraduate Research Assistant

Port Angeles, WA, USA

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 Francisco, CA, USA

Student volunteer for the 2020 International Solid State Circuits Conference.

IEEE ISSCC Conference Student Volunteer

February 2019

University of Toronto

San Francisco, CA, USA

Student volunteer for the 2019 International Solid State Circuits Conference.

IEEE ISSCC Conference Student Volunteer

February 2018

University of Toronto

San Francisco, 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 Symposia.

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