

# Patrick Cote

San Diego, California, 92024

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[www.linkedin.com/in/patrickcote/](http://www.linkedin.com/in/patrickcote/)

[www.patrickcote.net/EE/](http://www.patrickcote.net/EE/)

## SUMMARY

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System-minded MSEE with low-level experience. Driven to understand the details but optimize for system and program level success. Ambitious and highly trainable. Motivated to pick up new skillsets and methodologies under minimal supervision.

- Skills: DSP, Embedded Systems, RF Engineering, Schematic Capture, Wireless Communication
- Software: OrCAD Capture, Libero, Riviera-PRO, AWR Microwave Office, MATLAB, Simulink, LTSpice
- Programming: C, MATLAB, VHDL, Python, Git, SVN
- Lab test equipment: DMM, DSO, RSA, VNA, VSG

## EXPERIENCE

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### **Electrical Engineer** – Innoflight, Inc. – San Diego, CA Oct. 2019 - Present

- Technical Lead on development of software-defined radio for UAV and Space applications
- Coordinate team of engineers in development of modem VHDL, software, PCBs, and RF design
- Collaborate with CTO and the Customer to define requirements and system architecture
- Characterized RF performance of prospective ADC/DAC hardware
- Schematic capture for modem processor board and L/S-band RF front end board
- Work closely with external PCB layout engineers and Fabrication/Assembly vendors
- Write RFFE control VHDL targeted for Microsemi IGLOO FPGA
- Board bring up, testing, and validation of RF and Digital boards
- Develop testing and verification plans for modem processor board and RF front end board
- Write quarterly reports for the Customer detailing technical progress
- Frequency planning, component selection, and cascade analysis for Ka-band receiver front end
- Troubleshoot apparent EVM degradation in X-Band RF Front End card
- Developed module dependency tracking system for Model Based System Engineering workflow
- Performed board- and system-level testing of production Flight Unit hardware
- Collaborate with Business Development on SBIR Phase I and II proposals

### **R&D Engineering Intern** – Schweitzer Engineering Laboratories – Pullman, WA May 2017 - Aug. 2017

- Designed and built hardware rack for automated testing of power protection relay hardware
- Wrote interface firmware for relay peripheral emulator boards
- Wrote technical user guide for automated testing rack
- Designed and prototyped hardware solution to auto-configure control addresses of relay I/O boards
- Performed trade study of physical, optical, and magnetic switches for auto-configure solution

### **Graduate Research Assistant** – Montana Tech – Butte, MT May 2018 - Aug. 2018

- Researched power system frequency estimation techniques
- Modeled least squares fitting, PLL, PMU, and zero-crossing algorithms in Simulink
- Simulated renewable power systems using MATLAB Simscape Toolbox
- Tuned estimation algorithms and designed filters for synthetic inertia applications

### **Undergraduate Research Assistant** – Montana Resources/Montana Tech – Butte, MT May 2016 - May 2018

- Developed unmanned boat for automated collection of water samples from a contaminated lake
- Schematic capture and PCB layout of instrumentation and control boards
- Wrote embedded C code for firmware for MSP430 microcontrollers
- Built web server to interface with microcontrollers for remote operation and real-time data logging

### **Freelance Photographer** – Patrick Cote Photography Nov. 2007 - Dec. 2016

### **Photojournalist** – The Daily Inter Lake – Kalispell, MT June 2011 - Aug. 2014

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## EDUCATION

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- M.S. Electrical Engineering** – Montana Tech – *Butte, MT* – 4.0 GPA *Jan. 2018 - Aug. 2019*
- B.S. Electrical Engineering** – Montana Tech – *Butte, MT* – 3.94 GPA *Aug. 2014 - May 2018*
- B.A. Journalism** – University of Montana – *Missoula, MT* – 3.09 GPA *Aug. 2006 - Dec. 2009*

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## PROJECTS

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- IoT Swimming Pool Water Monitor** – *Personal – San Diego, CA* *June. 2020 – current*
- Developing a WiFi-connected sensor platform to monitor temperature and pH of home pool
  - MSP430, ESP8266 Wi-Fi Module, I2C LCD Display, One-Wire Temperature Probe
  - Designed and simulated pH Probe biasing and buffer amp circuit
  - Designed Solar Cell and Li-Ion Battery charging circuit
  - Schematic capture and PCB layout of custom board
  - Prototype testing in progress
  - Web-based monitoring interface TK
- RF Communication in Drill Pipe** – Montana Tech – *Butte, MT* *Aug. 2018 – Aug. 2019*
- Master's thesis research to evaluate the potential of using drill pipe as a waveguide for downhole communication in oil and gas drilling applications
  - Designed and built test setup to measure propagation losses in up to 40' of fluid-filled pipe
  - Performed experiments to characterize dielectric properties of various drilling fluids
  - Modeled electromagnetic wave propagation of test setup using Ansys HFSS
  - Validated model and methods using fluids with known dielectric properties
  - Analyzed results to determine feasibility of the proposed system
- M-QAM Modem Lab Demo** – Montana Tech – *Butte, MT* *Aug. 2018 – Aug. 2019*
- Master's project to develop M-QAM modem and FEC demonstration for undergraduate telecom class
  - Used MATLAB Comm Libraries and custom libraries to develop QAM modem
  - Wrote custom frame detection, frequency offset, carrier recovery, and timing recovery functions
  - Custom GUI interfaces with AWG and DSO for Tx and Rx capabilities
  - Investigated and implemented digital pre-distortion techniques
- Autonomous Mining Drone** – Montana Tech – *Butte, MT* *Aug. 2017 - May 2018*
- Senior Project to build autonomous quadcopter for use in safety inspections of underground mines
  - Schematic capture, PCB layout, fabrication, and assembly of sensor array board
  - Wrote control software for autonomous flight and basic object detection

For more project details visit: [www.patrickcote.net/EE/](http://www.patrickcote.net/EE/)