# Sam Babb

**Expertise:**

- Computer Power Systems
- Analog Design
- Root Cause Analysis
- Circuit Troubleshooting
- EMI/RFI
- Transmission lines / Signal integrity
- PCB design
- Sensors

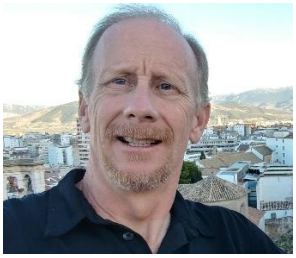
**Projects:**

- Metal Disintegrator
- NDIR gas sensor
- Low-Cost engine testing
- In-cylinder pressure transducer

**Personal interests:**

- Automotive Circuits
- Antique Cars

# Joe Bakel



**Expertise:**

- Computer architecture
- Hardware design, digital and analog
- Software design with an emphasis on embedded (both bare metal and RTOS) but have also done web apps, databases, Windows app, Android apps
- Microchip processors, Raspberry PI, Beaglebone

**Projects:**

- EDM's AP30jr hand held Phase sensor for 3 phase distribution lines. Include GPS, Cell modem, LCD with GUI, custom sensor and embedded processor running Debian Linux.
- Golf swing practice tool (under development) that includes load cell, electro magnet, LCD with GUI and embedded processor running FreeRTOS.

**Personal Interests**

- Open water swimming, running, triathlons
- Skiing
- Sailing
- Occasional ballet

# Doug Bartlett

Expertise:

- Software development & debug (C, objective C, shell, SQL, PHP, HTML)
- Embedded systems design (hardware & software)
- Sensors & sensor interfacing
- Bluetooth low energy & Zigbee
- Project management, planning, metrics & tracking
- Integrated circuit design
- Computer/microprocessor architecture

Projects:

- SmartMove - In-shoe physical activity tracking product design (sit, stand, walk, run, cycle, … and intensity level)
- Revolar - personal safety alert button
- Automotive CAN bus hacking & data collection
- System to measure/validate transmission gear ratios in race cars
- Software defined radio to intercept Honeywell/Ademco wireless alarm sensor signals

Personal Interests:

- Volunteer advisor for local tech startup businesses through the Innosphere
- Sports car road racing, auto crossing and high-performance driving coaching & instruction
- Hiking in the Rocky Mountains

## Christian Beccera

Expertise:

- Electronic Design
- Arduino Applications
- Motor Controls
- Circuit Troubleshooting
- 3-D Printing
- CNC PCB Machining

Projects:

- Instrumenting the CNC router at Loveland CreatorSpace.
- Prototyping a new electronic cain for blind people.
- Designing the electronics for a new industrial product.

Personal Interests:

- Volunteering at the Loveland Creator Space and the House of Neighborly Service.

# Susan Benzel

Expertise:

- Engineering program/project management
- Teamwork
- Leadership
- Communication

Projects:

- The Machine, Memory-Driven computing, storage software and hardware, Linux & Unix software programs
- I would be best at helping students figure out how to structure their project work, how to work better as a team, identifying their goals for their project, and how to find (and fill!) any holes in the plans for their project

Personal Interests:

- Road biking, healthy cooking, creating photo books and scrapbooks, promoting gender equity

# Tena Britt

Expertise:

- Matlab
- Dynamic Simulation and Modeling
- Small Signal Analog Circuit Design
- Digital Design
- System Engineering

Projects:

- Industrial turbine Fuel Valve Control and Prognostics, Industrial turbine adaptive speed control, aircraft engine control.

Personal Interests:

- Horseback riding, pastel painting, knitting, travel

# Roy Broeren

**Expertise:**

- Software Engineering
- Software Test Engineering
- Software Management
- Mobile connectivity, WLAN/802.11, Android
- International Project Development
- Software Lifecycle (Agile, Waterfall, EVO)

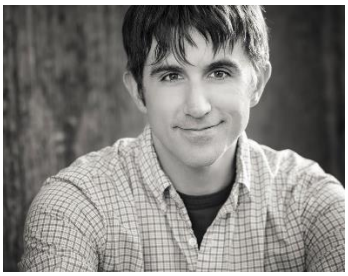
**Projects:**

- Smartphone Test & Development
- Smartphone & WLAN integration
- Home Routers, IoT

**Personal interests:**

- Bicycling
- Hiking
- Canoe & Kayak
- World & US History

## Josh Datko



Expertise:

- Information security, cryptography, hardware security.

Projects:

- I'm the security architect for a cryptocurrency hardware wallet design with a microprocessor, touch screen, and specialized security integrated circuits. I've experiment with fault injection techniques (glitching attacks) to cause microcontrollers to fail security checks and I built a spy-agency like DIY hardware implant with I2C and a GSM modem.
- If you are working on a cybersecurity project, I'd very much like to help! Other technical areas I can help with are microcontroller and microprocessor integration and firmware. Lastly, I can help with software tooling and recommendations for source code control and best practices.

Personal Interests:

- I really like to read. I read about 60 books last year. Lately, I've been getting back into amateur radio by exploring some digital modes with low power in the high frequency radio spectrum.

## Chuck Duey

Expertise:

- RF/RF CMOS IC design
- Raspberry Pi / Arduino Hardware, Software, and Projects.
- Software Defined Radio
- Sensors - analog and digital.
- Network and Webpage security

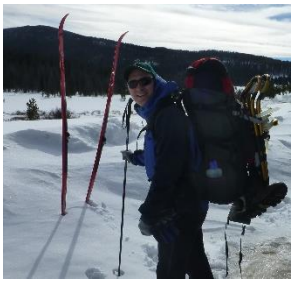
Projects:

- Brewery Control using Raspberry Pi
- Phased array shifter using PIN Diodes and PIC Controller
- Raspberry Pi Hat / BeagleBone Cape unified project board

Personal Interests:

- Embedded Linux, and Small Computer systems. Amateur radio, Volunteer Firefighter setting up radio communication systems for wildfire.

# Dan Endries



Expertise:

- Sales, Sales Engineering, and marketing
- Carrier Ethernet
- PON
- packet optical (DWDM)
- international business
- Wi-Fi and home networking

Projects:

- selling fiber equipment for connecting the internet
- Would help students with: personal interactions, team management

Personal Interests:

- Gardening
- Zymurgy
- Mountain biking
- Backpacking
- Stock market speculation

# Scott Evans

Expertise:

- Entrepreneurship
- IOT System Design
- Embedded System Design, Firmware, Hardware Design, Schematics,Analog, Rf
- Business: Accounting, Finance, Marketing, Market Research, Sales and Sales Management
- Mathematics

Projects:

- Radar System Design, Biomedical Calibration System, Ultra-high Speed ADC Test System and Component Evaluation, Embedded Educational Teaching System for Medical Education, Firmware Design in Biometrics, Optoelectronic/Laser schematic work, Radar System for Geo-location, GPS test system and test plan, IOT system design, including wireless charging, PCB fabrication and assembly contractor management, Engineering Proposals and Contracts, MCU/CPU selection for wearable IOT product.
- I can help student engineer teams with most electrical engineering and system design topics, plus team dynamics, leadership, and project management and structure.
- I am available for career questions: My career has evolved in reverse order compared to most engineers. Having owned a product design company in college, I decided to go into engineering marketing and sales early in my career. I then went on to start several businesses, and now I have returned to "hard core" engineering design.

Personal Interests:

- Entrepreneurship
- Camping
- Film-making
- Opera
- Van-dwelling

# David (Dave) Farrell

David Farrell, MSEE, PE, is the founder of Colorado Electronic Product Design, with offices in Broomfield and Loveland. Dave is the chair of the Denver and High Plains sections of the IEEE Signal Processing Society. Dave is an alumnus of CSU.

Expertise:

- DSP/C programming
- MicroController/IoT
- FPGA/VHDL/Logic Design
- Analog
- High Voltage

Projects:

- Electrosurgical Generator
- Defibrillator
- GPS
- IoT
- Would help students with finding information, reviewing their designs, and help with debugging

Personal Interests:

- High Power Rocketry
- Ham Radio
- Bicycling
- Camping/Backpacking
- Skiing

# Matt Heath

Expertise:

- Digital circuit design microprocessor and FPGA.
- CAN communication
- Natural Gas Turbine Power Generation Control Design
- Testing process
- Electronic manufacturing and process control.

Project Experience:

- Xilinx FPGA and Freescale 5553/4 microprocessor circuit design
- CAN communication circuit design
- LCD display and display driver circuit design
- Application Engineering
    - HMI Design
    - Waste Heat Recovery System Design for Natural Gas Turbine
    - Simulation of Power Generation and Power Management

Professional Interests:

- Working on unique ideas
- Mentoring people
- Additive Manufacturing
- Automation of any process

Personal Interests:

I have an electrical engineering degree from CSU and I am currently studying for my Professional Engineering Test. I currently play soccer and have since I was five years old. I have run anything from a 5km race to a marathon and even a couple ultra-races. I ride my mountain bike multiple times a week. When not running or mountain biking I will go hiking and backpacking. As with many home owners I enjoy building and remodeling projects around the house. One of my favorite projects that I work on is a frame up restoration on the first vehicle that I drove as a teenager; the vehicle is a 1971 Chevy K10 truck. One of the customer designs is a 4.3 inch display that I am adding to the custom dash.

# Chris Hofbauer

Expertise:

- Power Systems Engineering
- Control Systems
- Hydro Motors and Generators
- Medical Equipment and Electronics
- Electronic Troubleshooting and Repair

Projects:

Power Transmission System Development Projects
- Power Transformer and Substation Protection Projects
- Carter Lake Hydro Generation Plant
- Arc Flash Safety Development
- Medical Equipment Repair and Project Management

Interests:

Vintage Radio, Stereo, and Musical Equipment Refurbishing
- Running
- Gardening
- Cooking
- Fishing

# William (Bill) Hudson

Expertise:

- Electrical Engineering
- Applied Physics, Instrumentation, Optics
- Programming:  C, C++, Perl, Shell.
- Simple software design and documentation techniques.
- Revision control, Git, Subversion.
- Linux expert user.  Happy to help.
- VLSI design engineer at Hewlett-Packard for 31 years. I worked on the first PA-RISC processor chip to the last.
- Career, engineering job search.
- Agile project management. How to get the most out of your project with limited time and resources.
- Digital Logic, Microprocessors
- Materials, fabrication.
- How stuff works in the real world. I would love to see your project, and I have the time.

Projects:

- C++ Library for accessing GPIO pins on Raspberry Pi.
- Raspberry Pi data transfer from an FPGA.
- 1000V switched capacitor DC to DC converter design.

Personal Interests:

- Gardening, mostly flowers, shrubs and trees, in a wild style.
- Bicycling, mostly road and commuting.
- Hiking.

# Susan Hunter

Expertise:

- Optical system design with Zemax
- Laser physics
- Bio-Medical instrumentation
- Imaging and camera design
- Illumination and lighting

Projects:

- Putting Lasers into anything (computer mice, blood analyzers, data storage, etc.
- Helped CSU's Senior Design for Laparoscope

Personal Interests:

- Getting to the mountains
- Beekeeping
- Traveling

NOTE: Susan is an on-call Engineer in Residence which means she does not have regular office hours in B111 but can be contacted by leaving a message at csueir@gmail.com.

# Gary Kirkpatrick

Expertise:

- Mechanical Engineer
- experience in power transmissions
- reliability
- bearings
- machine design
- Solidworks
- vibration analysis
- thermal infrared
- high speed photography
- forensic engineering
- experienced machinist and welder (Gas & TIG).

Projects:

- Speed and Quality upgrades on large Coating and Plastic extrusion machines
- Can help students with mechanical drives, structures, bearing application and reliability.

Personal interests:

- Nature, Hiking, Woodworking, Metal working, Stone Carving, Private Pilot and currently building a full sized experimental airplane

Note: Gary will not have on campus hours this semester but is available. If you need help in his area of expertise contact him via email at: garykirkpatrick@msn.com or leave a message at csueir@gmail.com.

# Jonathan Lotz

Expertise:

- Digital Design
- Computer architecture
- General electrical design and debug
- Software design and debug
- Programming in C, Linux, Shell, Arduino, Raspberry Pi, and general computer programming
- Integrated Circuit Design and Fabrication
- Radio control (RC)

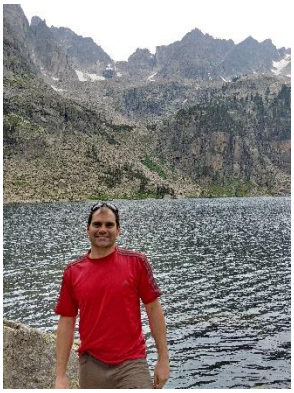
Projects:

- Various Arduino based home automation projects
- Raspberry Pie web server
- Radio controlled cars, aircraft and Quad-copters

Personal Interests:

- Renewable energy, Leadership coaching, woodworking, home projects, RC aircraft, Bicycling and hiking.

# Marty Malenshek



Experience:

- B.S. Marine Engineering
- M.S. Mechanical Engineering from CSU. Thesis project done at EECL/Powerhouse.
- 7 years as a USCG Licensed Office aboard merchant ships
- 10 years as Application Engineer at Woodward, Inc.

Projects:

- Control Systems
  - Engine control system for natural gas vehicles
  - Shipboard power generation and distribution system
  - Gas turbine control system
  - LabVIEW based vibration monitoring system
- Systems Engineering
  - Requirements development
  - SysML modelling
- Areas to help students
  - I'm open to help wherever I can. I have a lot of experience getting hardware to work with software. I am regularly involved in project planning (goals, scope, milestones) and would be happy to assist students with this. I can also take a look at resumes or discuss job interviews, since I have been on both sides of the table.

Personal Interests:

- Mountain biking – local trails and trips to Steamboat, Salida, Crested Butte
- Travel – I've been many places in Asia and Europe, even Antarctica.

## Steve Narciso

Expertise:

- Analog Circuit Design
- System Design
- Electronic Test and Measurement
- Project Management

Projects:

- IoT Teaching Materials, Microwave Design Teaching Materials, Electronic Instrumentation

Personal Interests:

- Cycling, Skiing, Travel

# Avpreet Singh Othee

Expertise:

- Graduate Student in Systems Engineering with strong background in control systems, power electronics, microgrid design and embedded systems. Fluent in C/C++.
- Extensive experience in firmware programming, testing, and debugging on a multitude of microcontroller architectures.
- Well versed in circuit analysis and PCB design. Proficient in various simulation and analysis tools. Knowledgeable and experienced in mechanical engineering with an emphasis on holistic product design.

Relevant Coursework

- Linear and Nonlinear Control Systems
- Power Electronics
- Digital Signal Processing
- Systems Engineering
- Robotics (Inverse Kinematics)
- Numerical Linear Algebra (Numerical Analysis)

Recent Projects:

- Designing a low power grid simulator
- Design of Control Tools for Use in Microgrid Simulations – Master's Thesis, Colorado State University 2017 (Advisor: Dr. Peter M Young)
- Designed microgrid simulations in Simulink using Simscape Power Systems Toolbox.
- Designed a Data Acquisition and control System Toolset using GNU Octave

# Peter O'Neill

Expertise:

- Data analysis, test & measurement
- Modeling & simulation
- Experiment design, quality & reliability
- Semiconductor device physics
- Integrated circuit fabrication
- A little bit of Arduino and Raspberry Pi microcontrollers

Personal Interests:

- Served 6 years on the Fort Collins Energy Board advising City Council on policy, founder and officer in the High Plains IEEE Section, traveled extensively in Europe, Australia, New Zealand, and a little in East Asia.

Note: Peter will not have on campus hours this semester but is available. If you need help in his area of expertise contact him via email at: pete_oneill@ieee.org or leave a message at csueir@gmail.com.

# Steve Pacheco

Expertise:

- Systems Engineering – Requirements, validation, risk, process tools, and customer interfacing
- Control Systems and Application Software
- Power Generation and Management (Utility and SmartGrid)
- Gas Turbine, Steam Turbine, Diesel and Generator Control Theory
- Communications networking
- Cyber Security methods

Projects:

- Global field service for Gas Turbine generators for utility grids
- Application engineer for many US Navy shipboard power plants
    - Automation control of the electrical power system with multiple generators
    - Load balancing, load sharing, and synchronizing of multiple gensets
    - Automated ship power transfers to and from shore power (national utility)
    - System design for robustness and automated casualty recovery
    - Human Machine Interface (HMI/GUI) design and theory
    - Simulation and modeling of electric plants
    - Personnel training systems
- Application engineer for many gas turbine controls used for generation and ship propulsion
- Implementation of Department of Defense (DoD) cyber security requirements
    - Currently working on a proof of concept with the US Navy for a secure communications protocol
    - System cyber security hardening; specs, MS Windows configuration, physical, and networking

Professional interests:

- Actuation
- Big Data (Collection, Storage, Machine Learning, Visualization)
- Mechanics
- Mentoring
- New Challenges

Personal Interests:

- My personal interests mainly revolve around the outdoors. Like most Coloradoans, I like to hike, fish, hunt, exercise, boat, and 4-wheel. I also really like working around the house and on cars to solve common problems associated with home ownership. I also like to be creative and make a lot of our home improvements, like wall decoration, shelves, tables, garden boxes, and room redesigns. I am also an associate instructor at the Krav Maga institute in Fort Collins.

# Charlie Potter

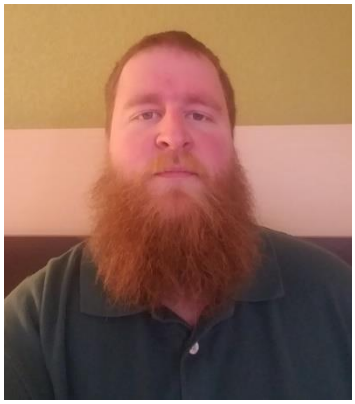
Expertise:

- Analog design, digital design and mixed systems
- Digital Signal Processing
- R&D Project management, IC's (the Optical Mouse), DSP Based Test Instrumentation for electronic and mechanical applications
- Product Development Strategy
- Vector Signal Analyzers

Personal Interests:

- Skiing- downhill and backcountry touring, Hiking and Backpacking, Bicycling, Whitewater rafting, International Travel, Photography
- Green Energy and Energy Conservation
- Wood and Metal Working
- Electronic design and Software

# Steve Rizor



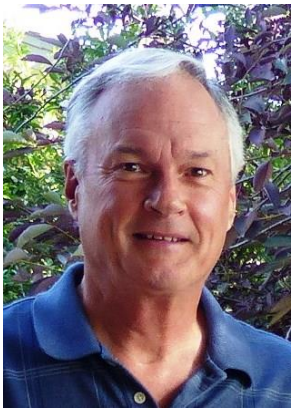
**Expertise:**

- - Software Engineering (primarily C/C++, some Java and others)
- - High-performance low-level software optimization
- - Linux programming, configuration, and tools
- - 3GPP Standards for WCDMA/LTE/5G NR, Layer 2
- **Projects:**
- Internal base station products at Qualcomm
- C-130J Hercules communications/navigation/identification systems test harness at GE Aviation

**Personal Interests:**

- Embedded systems software/hardware architecture
- PCB design
- Low-power embedded design
- Mentoring

# Lynn Schmidt



Expertise:

- General circuits and systems design (analog and digital)
- R&D product definition and design
- Digital Signal Processing, digital VLSI, imbedded SW, telecommunications
- Completed a 36 year career as an electronic product design engineer & manager for GE, HP and Agilent

Projects:

- Work: Sonar signal processing, Spectral Analysis, Electronic Instrument design, Digital Filter & FFT HW design, NMOS circuit design, High Volume IC testing (wafer and package).
- Hobby: Remote sensing projects (water depth, temperature, moisture content); Miscellaneous Raspberry Pi, Linux, Arduino, Photon, Picaxe, IOT projects; home automation, networking

Personal Interests:

- Travel, Tennis, Friends, Metal and fine wood working, investments, home improvement, reading

# Eli Scott

Expertise:

- Mechanical Design
- 3D modeling (solidworks)
- FEA
- Water proofing
- Seals
- Prototyping
- Injection molded part design
- Machined part design
- Hardware selection: screws, fasteners
- Plumbing
- Tolerance analysis
- Waterjet cutting
- CNC machine design, 3D printer design
- Sensors

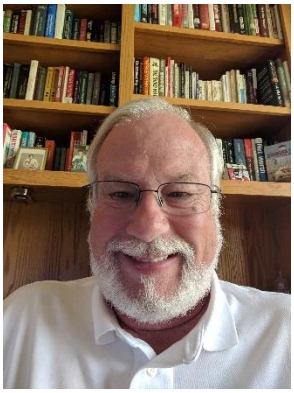
Projects:

- Water quality sensors
- CNC router
- 3D printer
- Waterjet cutting machine
- Arduino controllers

Personal Interests:

- Volunteering at the Loveland Creator Space, Investment in local startup companies, metalworking, home projects, water sports, boating

# Richard (Dick) Toftness



Expertise:

- CMOS Imagers
- Low Power Laser diode applications
- Low frequency analog design
- Integrated Circuit Fabrication

Projects:

- 3D laser ranging using high speed CMOS cameras, High Speed Camera Design, 3D printed magnetic couplers
- RFID Access Control System
-

Personal Interests:

- Volunteering at the Loveland Creator Space, Investment in local startup companies, woodworking, home projects

## Hugh Wallace

**Expertise:**

- BSc Hons Engineering Science (Microelectronics)
- Microelectronics (Chip designer HP-Agilent-Avago-Broadcom 34years)
    - Digital Design (Verilog,Synopsis,Mixed signal simulation)
    - Analog Design (Spice , Matlab)
    - SerDes test (Where digital get wibbly-wobbly at 54 Gbaud )

Software Talents/habits

- Python
- Ruby
- C++
- Jupyter Lab
- GIT
- OnShape 2D/3D CAD design
- 3D manufacture. Slic3r,Cura,ReplicatorG
- OpenSCAD
- Vi,EMAS,SED,AWK,MAKE, Perl (Under duress … GAK! :-( )

7 Patents … I Know how to be polite/patient to Patent Lawyers

- Micro Controllers,Embeded design
- Micropython
- Arduino
- ESP8266
- ESP32
- Sonoff hacking

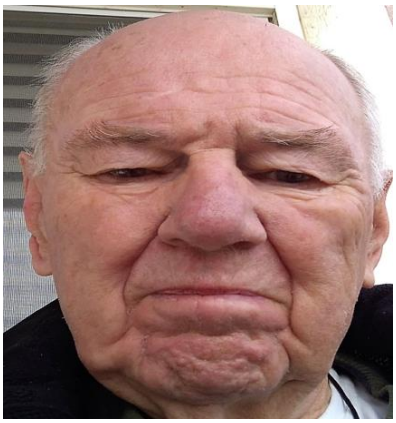
Stepper Motor control
Founding Member and current board member of Fort Collins Creator Hub
Designed and Built 150watt CO2 IR Laser cutter.
1.8m x 1m (5ft 10in x 3 ft)
Woodworking
Furniture Making.

**Projects:**

- 3D printing Proto parts for Laser Cutter
- CNC milling (Small GRBL controlled)
- Made CoreXY stage with plastic trim wood
- Laser Cutting.
- Proto Parts for Laser
- promotional examples for FCCH

**Personal interests:**
Hiking,Camping,Keep Fit , Home maintenance.

# Jim Whelehan



**Expertise:**

- Engineering program/project management
- Teamwork, Writing reports, presentations for marketing
- Low noise microwave/ millimeter wave receivers and components
- Space hardware
- Low noise techniques
- Radiometers
- Millimeter IC designs using microwave office
- Power amplifiers

**Recent jobs:**

- 200GHz Millimeter IC Low-Noise Amplifier for NASA
- Wideband beamforming for MDA
- All weather landing System for helicopters

**Personal Interests:**

- Working with IEEE MTT-s on Symposium
- Reviewing technical papers
- Walking