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## SUMMARY

Background in physics, geophysics, and electrical engineering. Physics specialty in space physics and aerospace. Geophysics specialty in electrical methods, potential fields, and instrumentation. EE specialty in electromagnetic scattering and wave propagation. Registered Professional Engineer (PE) in Colorado. Knowledgeable in tracking and surveillance instruments and data analysis. Experience with analyzing trajectory datasets, including filtering and estimation. Created a test and evaluation data quality assurance program. Computer programming with many language types, and GUI usage to streamline applications. Skilled in documentation, and also in HTML for easy access. Communicate well to a variety of audiences, and taught classes in navigation and space science.

## EXPERIENCE

Physicist and Tracking Instrument Analyst (2/2009-present)  
US Naval Air Warfare Station China Lake, California

Created a data quality assurance program for data test and evaluation, and applied these techniques to other development projects. Analyzed tracking and surveillance instrumentation datasets. Created methods and algorithms to triangulate trajectory positions, fuse datasets, and estimate trajectory paths with Kalman filtering techniques. Wrote many computer programs with easy to use GUI to streamline data analysis and processing. Became very proficient in MatLab, and HTML interface programs that use VB applets. Used knowledge of GPS and GIS to create maps for visualizing trajectories. Documented all procedures in very functional internal website created for easy user access and understanding.

Adjunct Professor (7/2004-6/2008)  
Embry-Riddle Aeronautical University at the Cheyenne Center, F.E. Warren Air Force Base, Cheyenne, WY; and at Colorado Springs Center, Schriever Air Force Base, Colorado Springs, CO; Webster University at Ball Aerospace Corp., and Metropolitan State College, Denver, CO

- Taught undergraduate classes in Navigation and Map Use in the Department of Earth and Atmospheric Sciences. Integrated GPS and GIS into the structure of both.
- Taught graduate aerospace classes in Space Applications, Earth Observation and Remote Sensing, Space Mission and Launch Operations, and GPS/GIS.
- Won a Faculty Course Development award from the Wyoming NASA Space Grant Consortium in 2005 to develop a Global Positioning System (GPS) course for Embry-Riddle.
- Won project development awards in 2006 and 2007, from the Wyoming NASA Space Grant Consortium and Embry-Riddle, to design, build, and launch a nano-satellite to demonstrate active orbital modification by including a thruster on it.
- 2008 - Won another project development award from Embry-Riddle to design and build a navigation system with IMU for tracking launched payloads; managed students to assist on project development.
- Served on graduate capstone project committees, advise students, and referee results.

Scientist and Engineer (5/2004-5/2005)  
Electromagnetic Applications, Inc. Lakewood, Colorado

Investigated GPS multipath problems for FAA LAAS proto-system intended for auto-land feasibility, and suggested solutions. Examined signal to noise characteristics from ground and building interference. Compared code and carrier errors (CMC) from numerous GPS satellites in airport environment. Evaluated GPS antenna characteristics, such as gain patterns, phase centers, linear and polarized (RHCP) types. Ran receiver computer models to evaluate errors and scattering from rough surface and random dipole distribution models.

Consultant (2002-2003)  
QuakeFinder, LLC Palo Alto, California

Wrote proposal to NASA to build and deploy ELF/ULF magnetometers along fault zones to investigate tectonic

events such as earthquake magneto-seismic emissions, and possible ionospheric effects. Recommended ELF bands for a CubeSat magnetometer, and assisted in calibration for this satellite prior to launch.

Researcher and Systems Engineer (7/1997-5/2001)

University of California at Los Angeles, Institute of Geophysics and Planetary Physics.

Designed, built, and deployed GPS-synchronized magnetometer data acquisition systems to observe global electromagnetic resonances. Planned and organized research & engineering to accomplish scientific objective of project. Designed digital and analog interfacing hardware and managed construction implementation. Programmed acquisition system, and processed signal in real-time to visually monitor. Set up LANs and networked acquisition systems to the Internet for fast data retrieval for group. Created data analysis routines in C++ and MatLab programs, also mentored groups to create additional routines. Compared results with spacecraft data.

Consultant (1997)

Entente, Inc. Boulder, Colorado

Translated a Basic program to C++ that translates the user's input language into another language.

Instructor (1994-1996)

Colorado School of Mines Golden, Colorado

- Taught FORTRAN programming for two semesters, and taught AutoCAD for two semesters for the Engineering Practices Introductory Course Sequence (EPICS) program (1995-1996).
- Taught electrical engineering lab class and managed experiments for Engineering Department (1994).

Research Intern (10/1993-8/1997)

USGS Golden, Colorado

Designed & built GPS-synchronized remote magnetometer data acquisition systems for magnetospheric data, analog and digital interfacing hardware. Responsible for expanding network of research collaborators by including UCLA and NOAA Space Environment Center. Planned, organized, and coordinated with US Air Force Academy, Los Alamos National Labs, and two Eastern European research institutes, and negotiated with private land owners to deploy and host remote observatory systems to deliver data for long periods. Wrote programming software for both the various acquisition systems and subsequent data processing. Instructed groups on use of hardware and software, and analyzed data for space physics and weather conditions.

Research Assistant (9/1988-11/1990)

University of Arizona Tucson, Arizona

Engineered and tested cross-borehole electromagnetic systems, in the field and models, for Army project. Built dipole antennas for boreholes. Tested antennas and propagated high frequencies in lossy geologic media to analyze attenuation and phase. Constructed 2200-gallon saline water tank to test radio wave propagation with model borehole antennas. Analyzed data to generate antenna patterns.

Teaching Assistant (1987)

Colorado School of Mines Golden, Colorado

Assisted with geophysics field class. Organized and conducted gravity and magnetics potential field mapping, to determine basement rocks (Colorado School of Mines, 1987).

Consultant & Independent Contractor (1985-1988)

Researched projects and conducted various geophysical surveys, such as:

- External acoustic detection of fluid levels, to monitor levels in borehole fracture tanks. Worked on mathematical propagation models of compression and shear waves.
- Wrote machine language program for microprocessor board to monitor operations for a printing press.
- Assisted electrical loop-on-loop surveys to determine the extent of contaminant flows from both the Rocky Mountain Arsenal and a gold mining heap-leach site in California.
- Conducted a magnetometer and seismic refraction survey in Nevada to map subsurface structures for mining interests.
- Conducted a magnetic gradiometer survey to find potential aquifer-polluting drilled and abandoned boreholes near a waste depository.
- Induced polarization (IP) survey to determine the depth to a permeable limestone layer hydrothermal source in Italy.
- Ground penetrating radar (GPR) to delineate subsurface soil disturbances at Casa Grande Nat'l Park.

- A VLF survey to map a landfill boundary.

Electronics Technician and Engineer  
Ophir Corporation

(7/1984-5/1987)  
Lakewood, Colorado

Designed and built proto-devices, e.g., radiometers. Designed and built model infrared hygrometer to measure water vapor in helium for nuclear power plant. Designed and built capacitive ice sensor device to measure liquid and solid components of ice, for use on aircraft. Evaluated additional projects.

## EDUCATION

Florida Inst. of Technology  
MS in Engineering Management & Aerospace Eng  
Colorado School of Mines / UCLA  
PhD in Geophysical Engineering  
University of Arizona  
MS in Geophysical / Electrical Engineering  
Colorado School of Mines  
BS in Geophysical Engineering  
Minors: electrical engineering and geology.

(Spring 08)  
Golden, Colorado  
(1999)  
Tucson, Arizona  
(1990)  
Golden, Colorado  
(1987)

## CERTIFICATIONS & SPECIAL TRAINING

- Registered Professional Engineer (PE) in the State of Colorado (Electrical Engineering).
- OSHA Hazardous Waste Operations and Emergency Response 40-Hour Training Program class.
- Languages: German (advanced), Spanish, and some Russian.

## PROFESSIONAL ASSOCIATIONS

American Geophysical Union, American Inst. of Physics