THOMAS A. REBOLD
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OBJECTIVE

Research and development of system, software, and/or hardware projects that will utilize my extensive problem solving skills

EDUCATION

Combined Master of Science and Bachelor of Science, Electrical Engineering and Computer Science, Massachussets Institute of Technology, 1987. Thesis: Dynamic error correction method for high speed analog-to-digital converters

SKILLS

- Remote and autonomous system development (power, control, instrumentation) using BASIC Stamp controller
- Communication systems engineering: link budgets, simulations and analysis
- Digital Signal Processing
- Extensive programming and modeling in C++, C, Matlab, Perl/CGI, PBASIC
- Software design, data structures, elements of genetic programming
- Unix/Linux automation and administration
- Field deployment and system testing
- Project management, outreach, institutional mediation

EXPERIENCE

8/00 - present CSIS/Engineering Instructor Monterey Peninsula College, Monterey, CA

Chair of Engineering and Computer Science since August 2006. Hiring, scheduling, evaluations, grant proposals. Created a new certificate program in Instructional Technology Skills to train Arabic language instructors at the Defense Language Institute.

Revised course curriculum for articulation with the University of California and California State University systems, and helped develop a four year Computer Science degree plan between MPC and CSU Monterey Bay.

Conceived and managed the creation of an institutional web tool (ACORN) that streamlines the course outline revision process.

Developed special topics curricula in Robotics, Game Programming, and Linux Applications, as well as transferable courses in C++, Data Structures, Unix/Linux (basics and administration), Engineering Graphics, and both engineering and computer science introductory classes. My full curriculum can be viewed at http://www.mpcfaculty.net/tom_rebold/.

Initiated and advised MPC's first student robotics club, which went on to win the only underwater "battlebot" competition hosted by Discovery Channel

(September 1, 2002), and also assisted subsequent teams yearly thereafter. Provided training in power systems, control and sensors.

1996 – 8/00 Satellite Communications Engineer, Jet Propulsion Laboratory

Developed national security/emergency preparedness priority access features for Iridium/Globalstar/ICO mobile satellite services, formulating development plan and mediating between industry and government representatives.

Designed and fabricated rugged, autonomous, wind and solar powered GPS stations for deployment to Antarctica: power electronics, state of health, weather monitors, and system integration. Performed field installation and maintenance on site in Marie Byrd Land.

9/97 - 2/98 Field Radio Technician, McMurdo Station, Antarctic Support Associates

Installed and debugged HF/VHF/UHF and microwave terrestrial and satellite radio systems in McMurdo environs, Dry Valley mountaintops, and deep field science camps.

1993 – 8/00 Radio Science Data Analyst, Jet Propulsion Laboratory

Modeled Lunar Prospector radio diffraction effects and applied to radio occultation measurements of the lunar limb, culminating in a 3D map.

Recovered Pathfinder radio Doppler profile across a two minute gap at Mars entry. Analyzed link statistics during rover-to-lander communication difficulties and advised mission controllers.

Developed Galileo radio science software analysis package: phase detection, frequency stability, NCO simulations, C and Matlab. Used package to isolate and diagnose data anomalies in flight systems and ground recording systems.

1987-1993 Deep Space Network System Development Engineer, Jet Propulsion Laboratory

Lead system engineer for Ka-Band link experiment with Mars Observer and Surfsat-1: link budgets, 34-m antenna pointing strategies, Doppler tuning algorithms, system testing, telemetry and ranging demonstrations, station operations, and link analysis.

1983-1987 Research Assistant, M.I.T. Lincoln Laboratory, Lexington, MA

Invented a novel signal-based approach to classifying dynamic errors on high speed analog-to-digital converters, yielding 20 dB reductions in spurious components.

PROJECTS

Chairisma 2.0 (Tom Rebold and Steven Jacobs) shown at SubZERO 2009. A time lapse video of this fully autonomous robotic walking chair in operation is available here.

Wind Power Challenge (Tom Rebold and ENGR1 class) was held at Marina State Beach in December 2008, and featured 5 different final project designs for capturing wind energy based on the same exercise machine motor.

Robotics Final Projects (Tom Rebold and ENGR50 class) Over three different semesters, student final projects for ENGR50 Robotics have been captured on video: Fall 2008, Fall 2007, Spring 2007.

Bot MATE-Tricks (Tom Rebold and team) won the first Discover Channel's "Depth Charge" ROV Challenge. Designed power electronics and control circuitry for the bot's 5kW electrical system.

Antarctic GPS Sampling Stations (Tom Rebold and team) were developed and installed in Marie Byrd Land, Antarctica by a 3-person team of JPL researchers in the fall of 1998 to record cm-scale crustal plate motion of West Antarctica.

PUBLICATIONS

T. Rebold, Sun Dogs and Ice Snakes: Down Home at Siple Dome, Antarctic Sun, McMurdo Station, p15, January 10, 1998.

T. Rebold, Wiring Antarctica's Dry Valleys, Antarctic Sun, McMurdo Station, Antarctica, p3, November 15, 1997.

G.E. Wood, S.W. Asmar, T.A. Rebold, R.A. Lee, Mars Pathfinder entry, descent, and landing communications, Telecommunications and Data Acquisition Progress Report 42-131, vol. Jul-Sep 1997, Jet Propulsion Laboratory, Pasadena, CA, Nov 15, 1997.

T.A. Rebold, M. Tinto, S.W. Asmar, E.R. Kursinski, Neptune revisited: synthesizing coherent Doppler from Voyager's noncoherent downlink, Telecommunications and Data Acquisition Progress Report 42-131, vol. Jul-Sep 1997, Jet Propulsion Laboratory, Pasadena, CA, Nov 15, 1997.

M.K. Bird, R. Dutta-Roy, S.W. Asmar, T.A. Rebold, Detection of Titan's ionosphere from Voyager 1 radio occultation observations, ICARUS 130: (2) 426-436 Dec 1997.

T.A. Rebold, A. Kwok, G.E. Wood, S.A. Butman, The Mars Observer Ka-Band Link Experiment, Telecommunications and Data Acquisition Progress Report 42-117, vol. Jan-Mar 1994, Jet Propulsion Laboratory, Pasadena, CA, pp250-282, May 15, 1994.

T. Rebold, Imagining Whale Songs, Interspecies Newsletter, Friday Harbor, WA, Spring 1991.

T.A. Rebold, J.F. Weese, Parkes Radio science system design and testing for Voyager Neptune encounter, Telecommunications and Data Acquisition Progress Report 42-99, vol. Jul-Sep 1989, Jet Propulsion Laboratory, Pasadena, CA, pp189-205, Nov 15, 1989.

N.C. Ham, T.A. Rebold, J.F. Weese, DSN Radio science system design and testing for Voyager Neptune encounter, Telecommunications and Data Acquisition Progress Report 42-97, vol. Jan-Mar 1989, Jet Propulsion Laboratory, Pasadena, CA, pp252-284, May 15, 1989.

T.A. Rebold, T.K. Peng, S.D. Slobin, X-band noise temperature near the Sun at a 34-m high efficiency antenna, Telecommunications and Data Acquisition Progress Report 42-93, vol. January-March 1988, Jet Propulsion Laboratory, Pasadena, CA, May 15, 1988.

T.A. Rebold and F.H. Irons, A phase plane approach to the compensation of high speed analog to digital converters, in Proc IEEE Int. Symp. Circuits and Systems, p.455, May 1987.

F.H. Irons, and T.A. Rebold, Characterization of high frequency analog to digital converters for spectral analysis applications, MIT Lincoln Laboratory, Lexington, MA, Project Report AST-2, Nov. 1986.