Courtney B. Duncan
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OBJECTIVE

Enable, enhance, and expand space exploration with miniaturized radio and computational technology.

EXPERIENCE

- Radiometric navigation systems, radio communication systems, and software defined radios;
- Real time software for flight and ground systems;
- Deep space navigation, mission design, analysis, and simulation software;
- Digital and radio frequency hardware;
- C++, C, Fortran, Basic, Forth, assemblers, Python, html, Linux, OSX, Windows, Cocoa, tools;
- Small spacecraft.

ACCOMPLISHMENTS

- 2009 July to present: Senior Member of the Technical Staff; Advanced Radiometric and Gravity sensing Instrument Group; Tracking Systems and Applications Section; Jet Propulsion Laboratory.

    o *GRAIL GPA Engineer.*

      Responsible for functional implementation and verification of the Gravity Processor Assembly, a micrometer-precision, two-way radio time transfer and radiometric system using Ka- and S-Band links. GRAIL launches to the moon in fall 2011.

    o *LMRST-Sat (Low Mass Radio Science Transponder).*

      Principal Investigator of a DRDF task to demonstrate a small satellite implementation by combining an RSTI with a Cubesat bus in cooperation with SSDL at Stanford University.

- 2002 to 2008: Navigation Software Group, Guidance, Navigation and Control Section; Jet Propulsion Laboratory.

    o *Member of the Monte software development team.*

      Work on navigation filter, models, and other software components for an eight-year, twenty million-dollar project that was recently certified at CMMI Level 3.

    o *2005–2007: Engineering Lead, Electra Navigation.*

      Coordinated technology tasks to extend the capabilities of the JPL-developed Electra software defined radio for in-situ navigation. Developed Sparc based real-time navigation filters for approach and entry phases. Managed an Electra navigation lab. Tasks totaled half a million dollars over three years and were featured in NASA Tech Briefs.

- 1999 to 2002: Real Time Software Group, Interferometry Systems and Technology Section, JPL.

Software lead for the Micro Arcsecond Metrology test bed optical interferometer experiments in support of the Space Interferometry Mission development. Led a team of ten software developers in work involving software, hardware, and optics.

- 1987 to 1999: GPS Systems Group, Tracking Systems and Applications Section, JPL.

    o *1996-1999: Shuttle Radar Topography Mission Global Positioning System Receiver Instrument Manager.*

    Oversaw the million-dollar development and delivery of Black Jack GPS receivers and antennas to the Shuttle Radar Topography Mission that provided orbital positions to sub-meter accuracy. This involved hands-on software and hardware development, work with data post processing groups and interaction with management at all levels across a range of organizations (JPL, KSC, NIMA) including mission astronauts. STS-99 was flown successfully in February 2000. Received the NASA Exceptional Service Medal.

    o *1993-1996: GPS-MET, Microlab-I Instrument Real Time Scheduling Software.*

    Developed software to determine orbit, time, and coarse attitude, and to autonomously schedule the GPS atmospheric sounding science on GPS-MET, an instrument on the Orbital Sciences MicroLab-1, launched on Pegasus, April 3, 1995. Several related innovations resulted in New Technology Reports.

    o *1987-1999: Rogue GPS Receiver Team Member (JPL GPS Systems Group)*

        ▪ Real time navigation solution and propagation.
        ▪ Receiver self-calibration hardware.
        ▪ Delivery to DSN stations.
        ▪ Field experiments.
        ▪ Data interface modules.

- Professionally relevant amateur radio achievements:

    o 1988–1991: Operations Vice President of AMSAT-NA (Radio Amateur Satellite Corporation - North America).

    Instituted and managed a worldwide volunteer command station organization for four amateur radio Microsats launched on Arianne V-35 in January 1990. These Microsats, produced for about $300,000 each with significant donated engineering labor, are direct ancestors of today's university **Cubesats**.

    o 1999 – present: Active member of the DSP-10 Software Defined Radio development and experimentation group initiated by Bob Larkin, W7PUA. A major goal is to push back the weak signal frontier by two or three orders of magnitude enabling new classes of achievements and discoveries from modest stations.

    o Amateur Extra class licensee N5BF. Licensed since 1972.

EDUCATION

- 1991-1996: MSEE, Communications Systems, University of Southern California
- 1981-1985: BSEE, Summa Cum Laude with Honors, University of Houston
- 1974-1978: BM, Piano Performance, Baylor University

EMPLOYMENT HISTORY

- 1987-present: JPL, Senior Member of the Technical Staff (see above)
- 1986-1987:   Microlink, Houston, TX, paging system software developer
- 1983-1986:   MTS, Cypress, TX, electronics technician, designer
- 1983-1983:   Johnson Space Center, Houston, TX, coop in communications division
- 1980-1981:   Warner Cable, Houston, TX, installer – technician
- 1978-1980:   KXTX, TV-39, Dallas, TX, video tape editor, transmitter operator

PUBLICATIONS, AWARDS, TRAINING, and REFERENCES

Separate listings will be provided on request.   02/02/09 cbd