Capt Shankar Kulumani

CONTACT INFORMATION

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RESEARCH INTERESTS

Astronautical Engineering with applications in control systems theory: Focus on spacecraft attitude dynamics and control, estimation and orbit determination

EDUCATION

Purdue University, West Lafayette, IN **January 2011 to December 2013**

M.S., Aeronautics and Astronautics Engineering

- Overall GPA: 3.66/4.00
- Area of Study: Spacecraft Dynamics and Control

United States Air Force Academy, Colorado Springs, CO **June 2005 to May 2009**

B.S., Astronautical Engineering

- Overall GPA: 3.35/4.00

PROFESSIONAL EXPERIENCE

United States Air Force, Kirtland AFB, NM

Lead Test Engineer, Air Force Research Laboratory **August 2011 to July 2014**

- Created orbit determination software for geo-stationary GPS receiver validation
- Designed astrodynamics force model for AFRL satellite science experiment
- Developed attitude control simulations for CMG test-bed known as Attitude Control System Proving (ACSPG) ground
- Developed ground transmitter geolocation via satellite time difference of arrival algorithm
- Led incorporation of satellite relative motion dynamics,guidance and control for simulation on embedded robotic system
- Implemented miniature inertial measurement unit (IMU) sensors for attitude control experiments
- Managed space situational awareness software development by leading diverse team of universities, industry, and government in effort to create integrated orbit determination software

Deputy Space Vehicles Lead, Responsive Space Squadron **May 2009 to August 2011**

- Responsible for development, integration, test, & launch of ORS-1 satellite
- Extensive experience with technical management of diverse contractor/government team
- Resolved $600K satellite hardware issues and prevented ORS-1 launch delays
- First hand experience monitoring 100+ days of integration and build of ORS-1 satellite
- Assessed 200+ satellite test plans leading to successful test campaign

PROFESSIONAL MEMBERSHIPS

American Institute of Aeronautics and Astronautics (AIAA), Member, 2012–present

Sigma Gamma Tau, Member, 2008–present

QUALIFICATIONS AND SKILLS

MATLAB skill set:

- Linear algebra, Monte Carlo analysis, Optimization, GUI development, statistics, estimation, orbit determination, data processing, visualization, dynamical system simulation, SIMULINK

Design Software:

- Solidworks, ProEngineer, AutoCAD

Computer Programming:

- Experience with C, C++, UNIX shell scripting, DVCS (Git)

Desktop Editing and Productivity Software:
- TEX (LATEX, BIBTEX, PSTricks),
- Microsoft Office, OpenOffice.org, LibreOffice, Google Docs
- GIMP, InkScape

Operating Systems:
- Microsoft Windows family, Apple OS X, Linux/UNIX

Hardware Systems:
- PhaseSpace motion capture system
- Embedded robotic systems

Technical Training
- First aid training including Self Aid Buddy Care (SABC), CPR Heartsaver

EXPERTISE

Control Theory and Engineering:
- Linear and Nonlinear Systems Theory, Feedback, Optimization, Digital Control

Communications and Signal Processing:
- Probability, Random Variables, Stochastic Processes, Estimation, Statistical Inference

Astronautical Engineering:
- Analytical dynamics, Attitude Dynamics, Astrodynamics, Orbit Determination, Rocket Propulsion

AWARDS

United States Air Force Academy
- Awarded Commandant/Dean pin 8 consecutive semesters for high military/academic performance (2005-2009)
- Top Academic Performer - Astrodynamics 321 (2007)

SECURITY CLEARANCE

Department of Defense Top Secret SCI (awarded: 2010)