

## Sharan Asundi “KJ4UYW”

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### Education

**Ph.D., Aerospace Engineering** **University of Florida (Summer ‘11)**

**Dissertation:** CubeSat System Design Based on Methodologies Adopted for Developing Wireless Robotic Platform

**M.S., Aerospace Engineering** **University of Florida (Fall ‘10)**

**Project:** Design & Development of a Linux-based Autonomous Wireless-capable Self-diagnosing Vehicle

**B.E., Mechanical Engineering** **Bangalore University (Spring ‘01)**

**Project:** Design, Fabrication & Testing of Electric Resistance Furnace for Melting Aluminum & its Alloys

### Work Experience

**Tuskegee University – Assistant Professor, Department of Aerospace Engineering** **Jan ’12 – Current**

**Synopsis** – (i) Research: Write proposals and publish papers in the design and development of small satellite systems, particularly CubeSats and (ii) Teaching: Impart training/teaching in the theory and application of orbital mechanics, satellite design and control systems engineering.

**Tata Infotech Ltd (INDIA) – Senior Systems Engineer** **Feb ‘01 – Dec ‘03**

**Synopsis** – Development, system testing and performance evaluation of computer systems, including hardware and software, for clients in US. Clientele included Supervalu, University of Wisconsin, UN, Catalyst, World Book Online, Merk Sharp & Dhome and Business Marketing Inc.

### Research Interest

- Design and Development of Autonomous Ground and Space Systems
- CubeSat Systems Engineering
- Spacecraft Attitude Dynamics, Attitude Determination and Estimation
- Vehicle Health Monitoring
- Small Satellite Mission Operations

### Research Experience

**Fall ‘04 – Present**

- Working with Space Systems Group to build **SwampSat**, a picosatellite capable of rapid retargeting and precision pointing. Specifically involved in designing the electrical power system, command & data handling, attitude determination & estimation, telemetry handling and on-orbit operations.
- Designed and built a Linux-based Autonomous Wireless-Capable Self-Diagnosing Vehicle (LAWS-V), for evaluating subsystems, sensor technologies and health monitoring capabilities relevant for small satellites in general and CubeSats in particular.
- **SwampSat is scheduled for launch in 2013 through NASA’s ELaNa program**

### Teaching Experience @ Tuskegee University

1. Satellite Design (AENG0468) **Spring ’12, ‘13**
2. Advanced Space Mechanics (AENG0469) **Spring ‘12**
3. Fundamentals of Aerospace Mechanics (AENG0340) **Fall ‘12**
4. Automatic Controls (AENG0460) **Fall ‘12, Spring ‘13**
5. Controls Laboratory (AENG0460) **Fall ‘12, Spring ‘13**

## Research Proposals (Submitted)

- Topic: *Evaluation of Satellite Drag Models Through a CubeSat Mission Design Based on Systems Engineering Approach*  
Agency: National Aeronautics and Space Administration (NASA)  
Program Title: Experimental Program to Stimulate Competitive Research (EPSCoR)  
Duration: September '13 – August '16  
Role: Co-Investigator and Project Director  
Total Requested Amount: \$674,971
- Topic: *Development of a Systems Engineering Framework as a Software Tool for the Design and Development of CubeSats* (Declined)  
Agency: National Science Foundation  
Duration: January '13 – December '15  
Role: Principal Investigator  
Total Requested Amount: \$274,294

## Research Publications

1. **Asundi, S.**, Fitz-Coy, N. "Design of Command, Data and Telemetry Handling System for a Distributed Computing Architecture CubeSat" IEEE Aerospace Conference 2013, Big Sky, Montana, March 2013
2. **Asundi, S.**, Fitz-Coy, N. "CubeSat Mission Design Based on a Systems Engineering Approach" IEEE Aerospace Conference 2013, Big Sky, Montana, March 2013
3. **Asundi, S.**, Latchman, H., Fitz-Coy, N. "Attitude estimation for picosatellites with distributed computing platform using Murrell's algorithm of the extended Kalman filter" 21st AAS/AIAA Space Flight Mechanics Meeting '11
4. Munoz, J., Nagabhushan, V., **Asundi, S.**, Fitz-Coy, N. "High Fidelity Simulation of SwampSat Attitude Determination and Control System" 21<sup>st</sup> AAS/AIAA Space Flight Mechanics Meeting '11
5. **Asundi, S.**, Mahin, M., Nagabhushan, V., Lin, T., & Fitz-Coy, N. "Composite & PCB Based Implementations of a Solar Panel Design for SwampSat." 24<sup>th</sup> AIAA/USU Conference on Small Satellites '10
6. **Asundi, S. A.**, Waldrum, A. W., Fitz-Coy, N. G., and Chao, C. "Wireless heterogeneous robotic platforms for cooperative sensing in a self-configurable communication network." American Nuclear Society's Proceedings of 2008 Joint EPR RRS Topical Meeting '08
7. Leve, F., Allgeier, S., Nagabhushan, V., **Asundi, S.**, Buckley, D., Waldrum, A., and Hiramatsu, T. "ASTREC-I Detailed Design Report," FUNSAT IV Design Competition, '07-'08
8. **Asundi, S.**, Waldrum, A., Fitz-Coy, N. "A Testbed for Heterogeneous Autonomous Collaborative Agents," Proceedings of the Performance Metrics for Intelligent Systems (PerMIS) Workshop, NIST, August '07

### Manuscripts in Preparation

9. **Asundi, S.**, Fitz-Coy, N. "Evaluation of EKF-based Attitude Estimation Schemes for Pico- and Nanosatellites Using Sun Sensors, Magnetometer and Gyros" Journal of Astronautical Sciences
10. **Asundi, S.**, Fitz-Coy, N. "CubeSat System Design Based on Methodologies Adopted for Designing a Wireless Robotic Platform" IEEE Transactions on Aerospace and Electronic Systems
11. **Asundi, S.**, Fitz-Coy, N. "Design of Command, Data and Telemetry Handling System for a Distributed Computing Architecture CubeSat" IEEE Transactions on Aerospace and Electronic Systems

## Other Activities and Achievements

- Licensed Ham radio operator "KJ4UYW"
- Former president and member of Asha for Education @ University of Florida
- Successfully completed a full marathon, half marathon & several 15K races
- Computer system administrator for Space Systems Group
- Member of the Small Satellite Design Club @ University of Florida - Subsystem lead of the FUNSAT IV team @ UF which won the FUNSAT IV competition