Karthick Dharmarajan

📍 **Home**

✉ **Email:**

🌐 **Website:** www.linkedin.com/in/karthick-dharmarajan-73a1a496

Date of birth: 14/03/1994   **Nationality:** Indian

WORK EXPERIENCE

[10/07/2023 – 30/11/2023]

Aerospace engineer - Freelancer

RadiotechMC

City: Rome

Country: Italy

1. Contributed as a key member of the core team, instrumental in producing and manufacturing a cutting-edge GPS-based antenna receiver module with exceptional accuracy and efficiency.
2. Led the modelling and simulation efforts for the antenna receiver module's core architecture, showcasing expertise in utilizing advanced extended Kalman filter algorithms to ensure robust performance in diverse scenarios.
3. Involved in the development of sophisticated algorithms for satellite tracking, Inertial Navigation Systems (INS), and Software Defined Radio (SDR), amplifying the module's capabilities and reliability.

[01/11/2019 – 25/01/2023]

Ph.D Researcher-Dipartimento di Ingegneria Astronautica, Elettrica ed Energetica

Guidance and Navigation Lab (GNC), Sapienza University of Rome

City: Rome

Country: Italy

1. Detailed study and research on various collision avoidance techniques
2. Research on various control and navigation techniques for formation-flying spacecraft
3. Detailed study and analysis of various orbital control techniques such as LQR, MPC, Convex optimization
4. Development of control algorithms for satellites with an additional focus on propellant optimization, propellant balancing and coverage optimisation.
5. Research on various GNC techniques for Constellations and single satellite missions.
6. Conducted feasibility study of different formation flying scenarios like LEO formations, GTO formations, and Trajectory optimization for deep-space formations.
7. Research on feasible formation flying orbits for Metrology, Navigation etc.
8. Presented and published papers on Formation flying, Astrodynamics, Control and Navigation.

[01/11/2018 – 01/03/2019]

Intern in Ground Navigation Lab

Guidance and Navigation Lab (GNC), Sapienza University of Rome

City: Rome

Country: Italy

A research study to check the viability of Performing Pulsar Navigation as an approximate tool to determine the location on Earth and also further studies involving the use of Pulsar Navigation in Deep Space Navigation

Project Trainee

Bangalore Aircraft Industries Pvt. Ltd.

City: Bangalore
Country: India
-In-depth knowledge of Aircraft Structures and design methodologies
-Industrial experience in Catia, Nastran and Patran

EDUCATION AND TRAINING

SPECIAL MASTER IN AEROSPACE ENGINEERING - LAUREA A STATUTO SPECIALE IN INGEGNERIA AEROSPAZIALE

Sapienza University of Rome(Sapienza Università di Roma)

City: Rome
Country: Italy
Final grade: 109/110 **Level in EQF:** EQF level 7
Thesis: Collision avoidance for Satellites in formation flying
-30 e lode in Orbit Determination and Spacecraft Electrical Power Systems

Bachelor of Engineering in Aeronautical Engineering

Sathyabama Institute of science and Technology(Deemed to be University)

City: Chennai
Country: India
Field(s) of study: Engineering and engineering trades
-Detailed knowledge in Astrodynamics, CFD, Aircraft Structures, Thermodynamics, Finite Element methods
-Performed a model design for a 300 seat Passenger aircraft
-Final year thesis in Thermal Analysis of Nose cone in Re-entry vehicles

LANGUAGE SKILLS

Mother tongue(s): Tamil

Other language(s):

English

LISTENING C2 **READING** C2 **WRITING** C2

SPOKEN PRODUCTION C2 **SPOKEN INTERACTION** C2

Italian

LISTENING A2 **READING** A2 **WRITING** A2

SPOKEN PRODUCTION A2 **SPOKEN INTERACTION** A2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Technical

Matlab (Professional proficiency) | ECSS standards, Interface Control Documents | Simulink | Catia | Python | ANSYS | AutoCAD Mechanical | Solid Works | C/C++

Word processing and communication

Microsoft office (Professional proficiency) | Google Drive | Zoom | Mircrosoft Windows

PUBLICATIONS

[2022]

Remote sensing formation design exploiting coverage overlap area Parameters

Proceedings of 73nd International Astronautical Congress

[2022] **Cost optimal control for J2 modified formation subject to drag using MPC**

Proceedings of 73nd International Astronautical Congress

[2022]

Coverage optimization of satellite formations using Instantaneous overlap area

2022 IEEE 9th International Workshop on Metrology for AeroSpace- IEEE Xplore

[2021]

Orbit design for satellite formations devoted to space environment measurements

2021 IEEE 8th International Workshop on Metrology for AeroSpace- IEEE Xplore

[2021]

Flexible Reconfiguration for Formation Flying Spacecraft with Fuel Balancing

Proceedings of 72nd International Astronautical Congress

[2021] **Optimal Reconfiguration Manoeuvres in Formation Flying Missions**

2021 IEEE Aerospace Conference -IEEE Xplore

[2021]

Operational Orbit Acquisition for a Large Aperture Distributed Space Telescope

Proceedings of 72nd International Astronautical Congress

[2020] **Collision Avoidance for Satellites in Formation Flying**

Advances in the Astronautical Sciences(AAS)

[2020]

Optimal path planning for triangular spacecraft formations in circular and eccentric orbits

Advances in the Astronautical Sciences(AAS)

[2019] **Preliminary analysis and performance evaluation of the XNAV technique**

Proceedings of AIDAA International Congress, 2019, Rome

COMMUNICATION AND INTERPERSONAL SKILLS

Communication and interpersonal skills

-Excellent communication skills in English Language
-Good team player
-Excellent problem-solving skills.
-Capable of having good management skills and able to work with a group of people and organising them through my experience as a co-organiser in Technofest event held in Sathyabama Institute of Science and Technology

JOB-RELATED SKILLS

Job-related skills

1. Proficient in spacecraft engineering with expertise in satellite tracking, sensor fusion, formation flying and navigation. Adept in orbit modelling and mission design techniques.
2. Advanced orbital control algorithms (Linear and Nonlinear spacecraft control)
3. Demonstrated mastery in spacecraft navigational techniques, specializing in both Inertial and GNSS-based navigation.
4. Excellent understanding of Kalman filter
5. Proficient in navigating and implementing ECSS (European Cooperation for Space Standardization) standards, with specialized knowledge in E-10 system engineering and E-70 ground systems and operations.
6. Knowledge of various signal-processing algorithms and research in ground segment operations
7. 3D modelling and analysis of Spacecraft structures.
8. Knowledge of Satellite power systems and reliability standards.

Job-related skills