Devakumar Thammisetty

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Strengths

- Excellent aptitude in design, modeling, simulation of cryogenic propulsion systems (Python)
- Experienced in end-to-end system engineering and management of cryogenic engines & stages
- Scientific management of multidisciplinary projects, good communication skills
- Research oriented, goal driven problem solving abilities and effective team player

🏛 Education

2018- 2020	**Master of Science in Mechanical Engineering, EPFL, Lausanne (GPA : 5.51/6)** École Polytechnique Fédérale de Lausanne, Switzerland (2020) **Focus:** System modeling & Control, Minor in Management and Technology
2008 – 2012	**Bachelor of Technology Aerospace Engineering, IIT Bombay(GPA : 8.72/10)** Indian Institute of Technology Bombay, India (2012)

💼 Engineering Contributions

2012 –2014 **Cryogenic upper stage engine (Staged combustion cycle-LOX/LH2) start sequencing and high altitude experiments** *(CUS engine-GSLV MKII) - ISRO*

- Mathematical modeling of expander mode starting sequence & engineering
- Analysis of engine & stage feed system chilling - ground tests and launch
- Operations planning, execution and documentation (Assembly, testing, flight)

2014-2017 **Development of Cryogenic rocket engine & stage-LOX/LH2 (Gas generator cycle - CE20 for GSLV MkIII)** *-Liquid Propulsion Systems Center, ISRO, India*

- Performance modeling, test planning, execution and test data analysis for the powerhead testing and thrust chamber subsystem testing in ground
- Engine start sequence development, thrust and mixture ratio control for ground, high altitude experiments, stage testing and flight testing
- Analysis of propellant tank chilling, filling, pressurization, vent, and operations management at stage qualification and at launch pad
- Management of inflight propellant tank pressurization, optimal propellant outage, simulations & post flight data analysis.

Contribution recognised by *Indian National Academy of Engineering(INAE)* with the Young Engineer award for the year 2018 [Profile].

2017-2021	**Preliminary design of a 10 ton LOX-Methane upper stage engine & configuration of 20-ton engine for technology demonstration**

- Cycle analysis of LOX-Methane engine & preliminary configuration of staged combustion engine turbopumps, thrust chamber and gas generator
- Conversion of of LOX/LH2 based CE20 engine for LOX-Methane technology demonstration & hot test experiments

2020 –2023	**Engineered a real-time thrust control algorithm for the India's moon landing**
	-*Liquid Propulsion Systems Center, ISRO, India (Landed on 23rd August 2023)*

- Developed an onboard thrust control logic for the moon lander propulsion system & demonstrated the performance in ground experiments.
- Enhanced the thrust tracking performance through a custom designed closed loop controller with acceleration feedback.
- The algorithm was successfully tested in ground experiments in 2022 which performed accurately during landing operation resulting in a precise soft landing near the south pole on 23rd August 2023.

2021 –2022	**System engineering of Multiple satellite deployment in Orbit-** *ISRO, India*

- Cryogenic propellant management under microgravity conditions in-orbit for multiple satellite deployment
- Proposed, implemented a strategy for imparting in-orbit deltaV using the cryogenic upper stage for multiple satellite deployment (Implemented for OneWeb satellite launches on GSLVMkIII)

2022 - 2023	**Development & testing of 200 ton LOX/RP1 based engine for core booster stage**

- Developed simulation models for the testing of power head article on ground
- Prepared operating procedures and conducted multiple cold flow validation experiments on the test facility
- Developed engine start sequencing and tested the power head test article

July –Sep'19	**Engineering Internship, Asyril SA, Switzerland (Computer Vision, OpenCV)**
	Skills: OpenCV 4.1, Python programming, Agile software development
	Developed and tested vision algorithms for object recognition and localization.

⚗ Projects and Research Experience

Mar - Jun'20	**Master Thesis :** Development of Multi-phase Optimal Control Software - Python (Automatic Control Laboratory, Thesis Director: Prof. Colin Jones) (Grade 6/6)
	Skills : Optimal control, numerical optimization, software development [MPOPT]

Developed a state of art, novel and open-source software package in python for solving optimal control problems encountered in numerous scientific disciplines including aerospace engineering (24k+ PyPi downloads-Oct. 2023).

Sep–Dec'19	**Semester project: Embedded Real time optimization of a fuel cell system**
	Skills: Optimization of constrained nonlinear systems in real time, Quadratic Programming, C++, Model Predictive Control. (Direction: Prof. Colin Jones, LA3) *Numerical optimization methods, nonlinear system dynamics, Sequential Quadratic Programming(SQP) along with ADMM based QP solver.*
Feb – Jun'19	**Semester project: Interdisciplinary EPFL robotics competition (Team of 3)**
	Skills: Arduino, Raspberry pi, computer vision(Direction: Prof. Auke Jan Ijspeert). *Built a mobile robot which autonomously localizes and navigates in a given terrain [Video]. Programmed various vision based algorithms in Raspberry Pi. Implemented Kalman Filtering, State Machine and control with sensor feedback.*

🖥 Skills

Technical	● Cryogenic rocket propulsion, Physics based modeling, Control & Simulations. Numerical optimization, Computer Vision, System engineering & Management
Programming	● Python – numpy, scipy, scikit-learn, pandas, OpenCV, PyQt4, Django ● MATLAB/Simulink, OpenFOAM, ParaView, Gmsh, CAD, Solidworks ● C++, Eigen, CasADi, Qt4, Version control (Git)
Language	● English (Fluent), Hindi (Fluent) – Read, Write, Listen and Speak ● French (Beginner) – A1 level course work at EPFL ● Telugu (Mother tongue) - Read, Write, Listen and Speak

🏆 Awards

- **Young Engineer Award** by Indian National Academy of Engineering (INAE).
- **ISRO Team Excellence Award** for contribution towards maiden launch of GSLV-MkIII rocket.

⚛ Extra-curricular activities

Sports	● Table Tennis (Ping-pong), Tennis, Cricket
Other	● Travel, hiking, reading non-fiction

👤 Personal details

Citizenship	● India	**Civil Status**	● Married