

SASI KANTH VADDE

RESEARCH ASSISTANT

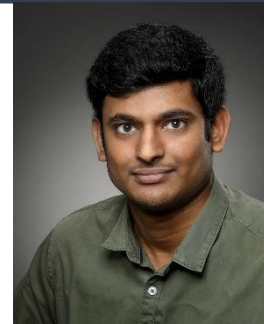
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■ PROFILE

Master's graduate in Chemical and Energy Engineering, currently working at DLR on Multiphysics modelling of electrochemical systems. My work focuses on two-phase flows, gas crossover, and thermal-fluid interactions in alkaline water electrolysis. Skilled in Python, Dymola, and data analysis, I bring strong problem-solving abilities to complex system challenges. With a passion for linking electrochemistry and process engineering, I aim to develop innovative modelling approaches that advance sustainable hydrogen technologies and accelerate the transition to clean energy systems.



■ WORK EXPERIENCE

Since 09/2023

Deutsches Zentrum für Luft- und Raumfahrt (DLR), Stuttgart (Germany)

07/2025 – Present

Research Assistant

- Developed transient system models of alkaline water electrolyzer stacks, capturing Multiphysics interactions (two-phase flow, heat transfer, gas crossover).
- Implemented and optimized PID control strategies for renewable grid-integrated operation to ensure system stability, efficiency, and gas purity.
- Designed and executed simulation scenarios to support process optimization and hydrogen system integration.

01/2025 – 06/2025

Master Thesis

- Topic: "Transient Modelling of an Alkaline Electrolyzer for Validating a Two-Phase Electrolyte Model."
- Built and validated a Multiphysics simulation model, linking electrochemical behavior with fluid and thermal transport processes.

06/2024 – 12/2024

Internship

- Mathematical modelling of mass transport phenomena of two-phase flow and across the porous membrane.
- Enhanced a power electronics model by integrating detailed AC/DC and DC/DC converter dynamics to study system-level energy efficiency.

09/2023 – 06/2024

Student Research Assistant

- Conducted experiments on a single-cell alkaline electrolysis test bench, including system preparation, operation, and performance evaluation.
- Collected and analyzed experimental data to support optimization of electrolysis process.
- Developed a steady-state Python model of an electrolyzer for parameter extraction and calibration with experimental data and literature values.

06/2023 – 08/2023

Otto von Guericke University, Magdeburg (Germany)

Student Research Assistant (HiWi)

- Developed Python/OpenCV algorithm to track bubbles in fluidized bed experiments with sinusoidal airflow, enhancing particle movement analysis.
- Designed and conducted fluidized bed experiments with varying inlet pressures, analyzing bubble dynamics to optimize drying processes.

06/2019 – 03/2021

GMR, Hyderabad (India)

Junior Engineer

- Gained foundational engineering experience at GMR Hyderabad, supporting operations and training in large-scale energy projects.
- Participated in hydro power plant construction training at Bajeli Holi, developing practical understanding of power generation systems and project execution.

■ EDUCATION

2021 – 2025

M.Sc. Chemical and Energy Engineering

Otto von Guericke University (Magdeburg, Germany)

- **Focus:** Computational Fluid Dynamics (CFD), Process Control & Systems Engineering, Machine Learning in Chemical Engineering, Multiphase Flows, Advanced Heat & Mass Transfer

2015 – 2019

B. Tech. Mechanical Engineering

GMR Institute of Technology (Rajam, India)

- **Focus:** Thermodynamics & Heat Transfer, Fluid Mechanics & Hydraulic Machines, Finite Element Methods, Power Plant Engineering & Energy Systems

■ PROJECTS

Numerical Simulations

- Performed CFD simulations in OpenFOAM to analyze flow and heat transfer between end plate and electrode in an alkaline electrolyzer.
- Simulated airflow around the Arc de Triomphe using CFD to evaluate flow behavior and aerodynamic forces.

Control Systems & Machine Learning Applications

- Designed and implemented PID control strategies for the Newell & Lee evaporator using MATLAB/Simulink.
- Developed and evaluated machine learning models in python to analyze and predict chemical process data.

■ LANGUAGES

English – fluent in writing and speaking (C1)

German – beginner (A2)

■ STRENGTHS

Modeling & simulation of electrochemical systems

CFD and heat transfer analysis (OpenFOAM, Python, MATLAB)

Control system design (PID tuning, renewable integration)

Strong analytical and problem-solving skills

Research-driven and quick learner

Effective teamwork and communication

■ SKILLS

Dymola

Python

MATLAB

Fusion 360

OpenFOAM

StarCCM+

OriginLab

Microsoft Office