

Sai Sudharshan Ravi

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EPFL PhD Excellence Program | KAUST GPA 4.0/4.0 | MIT-AU GPA 9.63/10 | 4+ publications | Indian patent

EDUCATION

Ecole Polytechnique Federale de Lausanne (EPFL)

PhD in Energy Systems

Switzerland

2023 - Present

- Model data-center energy hubs across campus, urban and European net-zero systems.
- Build MILP, techno-economic and life-cycle decision models in Python and AMPL.

King Abdullah University of Science and Technology (KAUST)

MS, Clean Combustion; GPA: 4.0/4.0

Saudi Arabia

2022 - 2023

- Completed graduate training in energy systems, combustion and quantitative analysis with highest GPA.

Madras Institute of Technology, Anna University

BE, Automobile Engineering; GPA: 9.63/10

India

2017 - 2021

- Built foundation in vehicle systems, thermodynamics and engineering design; graduated with strong academic performance.

RESEARCH AND PROFESSIONAL EXPERIENCE

EPFL

Switzerland

PhD Researcher, Energy Systems

- Built multi-objective MILP framework comparing direct heat reuse with exergy-aware ORC + heat-pump recovery for EPFL campus data-center integration.
- Showed data centers could supply up to 40% of campus district-heat demand and raise PV self-consumption by up to 28% through flexible workloads.
- Modeled EU-27, UK and Swiss net-zero systems; quantified 667 TWh/year of 2050 ICT electricity demand and up to 243 TWh/year of recoverable cooling heat.
- Demonstrated workload flexibility can reduce European renewable curtailment from >9% to ~6.5%, translating technical results into energy-planning recommendations.

University of Bath

United Kingdom

Visiting Research Student

- Analyzed non-combustion particulate emissions from electric vehicles and translated measurement findings into sustainability implications.

University of Tokyo

Japan

Research Intern

- Modeled sustainable energy pathways and applied optimization methods to low-carbon transport scenarios.

IIT Madras

India

Research Intern

- Simulated clean mobility technologies and supported policy-oriented analysis of energy and transport systems.

Maruti Suzuki

India

In-Plant Trainee

- Gained exposure to automotive systems maintenance, shop-floor safety and large-scale engineering operations at the largest passenger car manufacturer in India.

SELECTED RESEARCH OUTPUT

- Lead author, **Applied Energy** 402 (2026) 127049: modeled data centers as heat-active urban energy prosumers using MILP, ORC, heat pumps and district heating.
- Lead author, **Cell Reports Sustainability** 3 (2026) 100755: quantified workload-flexible data centers in Europe's net-zero energy system.
- Co-authored two 2023 papers in **Energy Conversion & Management** and **Science of the Total Environment** on e-fuels, EV pathways and mobility decarbonization.

LEADERSHIP AND ACHIEVEMENTS

- EPFL PhD Excellence Program student; completing leadership coaching, effective communication training and network-building with industry and institutions.
- Vice-President and Secretary, PolyValais / EPFL Valais Staff Association; organize campus events and initiatives reaching ~200 students, researchers and employees.
- Participated in BCG-mentored HackTheGlobe 2022 sustainability challenge, organized by BCG-affiliated professionals; developed a team app concept to reduce household food waste.
- Granted Indian patent for a smart remote-controlled fire-fighting hose, demonstrating initiative in engineering design and applied problem solving.

ADDITIONAL SKILLS

Technical: Python, R, C/C++, AMPL, MILP optimization, energy-hub modeling, simulation, data wrangling, life cycle assessment, techno-economic assessment

Languages: English - full professional; French - professional working proficiency; Tamil - native

Certifications: Certified yoga instructor; Python 3 Programming, University of Michigan; Data Science for Engineers, NPTEL Elite; Autonomous Driving Vehicles, University of Toronto