

Chethan Ramakrishna Reddy

🌐 <https://chethanreddy.github.io>, ✉ chethan.reddy@gmail.com, ☎ +1.906.275.9969 ♂ Pronoun - He, ☆ Date of birth - 14 Dec 1989,
† Citizenship - India, → US Work Authorization - F1-OPT, EAD Card Received, OPT Start Date (Available) - 21st Dec 2021

EDUCATION

MICHIGAN TECHNOLOGICAL UNIVERSITY

PHD IN MECHANICAL ENGINEERING

Co-advised by Dr Mahdi Shahbakhti and Dr Rush D. Robinett III
Research focus - Model Predictive Control of Energy Systems for Heat and Power Applications
Expected Dec 2021 | Houghton, MI
CGPA (so far): 3.77/4.00

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA

MTECH (MS EQUIVALENT) IN MECHATRONICS ENGINEERING

May 2013 | Surathkal, India
CGPA: 8.37 / 10, US equivalent CGPA: 4.00 / 4.00

EXPERIENCE

RESEARCH ASSISTANT | MICHIGAN TECHNOLOGICAL UNIVERSITY

May 2017 – Present | Houghton, MI

- Research on Model Predictive Control of (i) Building HVAC System with Solar Energy Integration, and (ii) Internal Combustion Engine with Waste Heat Recovery at the Energy Mechatronics Laboratory.

INTERN | HALLA MECHATRONICS

Jan 2019 – May 2019 | Bay City, MI

- Closed-Loop (Plant and Control) Model Development, Validation and Simulation of Electronic Controllers in Motor Controls Group.

SENIOR ENGINEER | ROBERT BOSCH INDIA

Sep 2015 – Aug 2016 | Bangalore, India

- Modeling & Simulation Expert in the System Engineering Group (Responsible for Hybrid and Battery Electric Vehicle).

ENGINEER | ROBERT BOSCH INDIA

Aug 2013 – Sep 2015 | Bangalore, India

- Plant model development, control model development, integration of models, and system simulation in modeling and simulation group.

INTERN | ROBERT BOSCH INDIA

Jun 2012 – Mar 2013 | Bangalore, India

- Plant Modeling Support and Simulation Based Research on Automotive Waste Heat Recovery using Thermo-Electric Generators (My Masters Thesis).

SELECTED PUBLICATIONS

- C. R. Reddy, V. B. Vinhaes, R. D. Robinett III, J. D. Naber, M. Shahbakhti, “**Model Predictive Control of a Waste Heat Recovery System Integrated with a Dual Fuel Natural Gas-Diesel Engine**”, in 2021 IEEE American Control Conference.
- C. R. Reddy, M. Shahbakhti, R. D. Robinett, and M. Razmara, “**Exergy-wise predictive control framework for optimal performance of MicroCSP systems for HVAC applications in buildings**”, in Energy Conversion and Management, Volume 210, pp.112711, 2020.
- M. Toub, C. R. Reddy, M. Razmara, M. Shahbakhti, R. D. Robinett, G. Aniba, “**Model-based predictive control for optimal MicroCSP operation integrated with building HVAC systems**”, in Energy Conversion and Management, Volume 199, pp.111924, 2019.

SKILLS

- Modeling, Simulation, Data Analysis, and Code Generation in Matlab/Simulink.
- Energy systems, energy storage systems (thermal energy storage, battery energy storage) modeling & simulation.
- Modeling of thermal, mechanical, hydraulic, pneumatic, electronic and electric sub-systems.
- 0D, 1D and 3D Modeling Techniques.
- Automotive System Simulation in GT-Suite, AVL, AMESim, CarSim. And Co-Simulation with Matlab/Simulink.
- Model Predictive Control. Optimal Controller Design. Optimization Techniques (IPOPT, CPLEX, GUROBI). Linear and Non-Linear Control Theory.
- Model, Software, and Hardware in Loop (MiL, SiL and HiL) Model Development and Testing. Tool chains - ETAS, DSPACE, and MotoHawk.
- Mechanical CAD. Tools - Solidedge, Solidworks.

PROJECTS

ACADEMIC

PhD Course Projects

- Fuel Consumption Reduction Technologies and Hybrid Vehicle Design
- Control System Development for a Hybrid Vehicle ECU (MotoHawk)
- Effect of External Supercharging in a CI Diesel Engine with Swirl Combustion Chamber (Simulation study)
- Efficacy of PV Solar Energy in Houghton, MI
- Decentralized Model Predictive Control for Thermal Control of buildings
- Optimal Control of Wave Energy Converters

Masters Thesis

- Development of Automotive Thermo-Electric Generator (ATEG)

Bachelors Thesis

- Design and Fabrication of Boundary Layer Turbine as a Potential Automotive Engine (Compressed Air as Fuel)

INDUSTRIAL

- Model-based Design, Testing, and Calibration.
- Modeling and Simulation of Electrically Assisted Power Steering System.
- Mechanical Design, Fabrication, and Controller Prototyping of Automotive Exhaust Active Noise Cancellation and Enhancement System.
- Bosch Boost Recuperation (Mild Hybrid Vehicle) System Simulation.