

# Chethan Ramakrishna Reddy

🌐 <https://chethanreddy.github.io>, ✉ [chethan.reddy@gmail.com](mailto:chethan.reddy@gmail.com), ☎ +1.906.275.9969 ♂ Pronoun - He, ☆ Date of birth - 12/14/89, † Citizenship - India,  
→ US Work Permit - O1-A (Authorized to work for Current Employer - Need sponsorship to work for Other Employer.), → US Permanent Residency  
(Green Card) Process Status - EB-1A (Self-Petition) approved with Priority Date of 6/7/23, Awaiting Priority Date to be current.

## INTEREST

- Training in Mechatronics Engineering, Modeling, Simulation and Model-based control of Energy systems.
- Motivated by Optimal Use of Energy, Renewable Energy, Clean Energy.

## EDUCATION

### PHD IN MECHANICAL ENGINEERING - MAR 2022

ENERGY MECHATRONICS LAB, MICHIGAN TECHNOLOGICAL UNIVERSITY, HOUGHTON, MI

RESEARCH FOCUS - MODEL PREDICTIVE CONTROL OF ENERGY SYSTEMS FOR HEAT AND POWER APPLICATIONS

CGPA: 3.77/4.00

### MTECH (MS EQUIVALENT) IN MECHATRONICS ENGINEERING - MAY 2013

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, INDIA

CGPA: 8.37 / 10, US equivalent CGPA: 4.00 / 4.00

## EXPERIENCE

### ENGINEER | FORD MOTOR COMPANY

Jan 2022 – Present | SF Bay Area/Remote, USA

- xEV model based calibration optimization.
- Powertrain energy management focus.
- Software in the loop focus.

### RESEARCH ASSISTANT | MICHIGAN TECHNOLOGICAL UNIVERSITY May 2017 – Jan 2022 | Houghton, MI, USA

- 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 | CONSTRUCTIS

Aug 2020 – Dec 2020 | MI/SC/Remote, USA

- System (Mechanical, Electrical, and Software) Definition, Design, and Analysis for the Roadway Kinetic Energy Recovery Pilot Product.

### INTERN | HALLA MECHATRONICS

Jan 2019 – May 2019 | Bay City, MI, USA

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

### SENIOR ENGINEER/ENGINEER | ROBERT BOSCH INDIA Sep 2015 - Aug 2016/Aug 2013 – Sep 2015 | Bangalore, India

- Modeling & Simulation Expert in the System Engineering Group (Responsible for Hybrid and Battery Electric Vehicle).
- Plant model development, control model development, integration of models, and system simulation in modeling and simulation group.

## SELECTED PUBLICATIONS

- C. R. Reddy, V. Bonfocchi Vinhaes, J. D. Naber, R. D. Robinett III, M. Shahbakhti, "Model predictive control of a dual fuel engine integrated with waste heat recovery used for electric power in buildings", in *Optimal Control Applications and Methods*, 2022.
- 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, 2019.

## SKILLS

- Model Based System Engineering.
- Modeling, Simulation, App Design, Data Analysis, and Code Generation in Matlab/Simulink.
- System Know how/Modeling of thermal, mechanical, hydraulic, pneumatic, electronic and electric sub-systems. 0D, 1D, 3D Modeling Techniques.
- System Simulation, Co-Simulation (CS) and Model Exchange (ME).
- Numerical Optimization Techniques / CPU usage Optimization Techniques / Simulation Model Optimization Techniques. High Performance Computing, Parallel Processing.
- Model Based Optimal Control Design, Model Based Calibration Optimization, Model Based Predictive Control Design. Linear & Non-Linear Model Based Optimization.
- Optimization Solvers & Techniques. Linear & Non-Linear Control Theory.
- Model, Software, and Hardware in Loop (MiL, SiL and HiL) Model Development and Testing.
- Mechanical CAD.
- Scripting/Software languages - Embedded C (Read), Embedded C++ (Read), Matlab (Read & Write), Python (Read & Write).

## PROJECTS

### INDUSTRIAL

- Model verification
- Model based calibration optimization
- Simulation (of the digital twin) speed improvement
- 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.
- Hybrid Vehicle System Simulation.

## ACADEMIC

### PhD Thesis

- Model Predictive Control of Energy Systems for Heat and Power Applications

### PhD Course Projects

- Fuel Consumption Reduction Technologies and Hybrid Vehicle Design
- Control System Development for a Hybrid Vehicle ECU (Moto-Hawk)
- 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 Thermal Control of buildings
- Optimal Control of Wave Energy Converters

### Masters Thesis

- (Model-Based) 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)