

Chethan R. Reddy

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♂ Pronoun - He, ☆ Date of birth - 14 Dec 1989, † Citizenship - India, → US VISA CLASS - F1

EDUCATION

MICHIGAN TECHNOLOGICAL UNIVERSITY

PHD IN MECHANICAL ENGINEERING

Co-advised by Dr Mahdi Shahbakhti and Dr Rush D. Robinett III
Research focus - Model-based Predictive Control of Co-generation Energy Systems
Expected Dec 2020 | Houghton, MI
CGPA (so far): 3.80/4.00

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-based 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 – Present | Houghton, MI

- System (Mechanical, electrical, & software) definition, design, and analysis for the roadway kinetic energy recovery pilot product.

TEACHING ASSISTANT | MICHIGAN TECHNOLOGICAL UNIVERSITY

Aug 2017 – Dec 2018 & Aug 2019 - May 2020 | Houghton, MI

- Lab instructor for courses focusing on (i) dynamics and control of mechanical systems, and (ii) introductory manufacturing processes. Both these consists mostly of senior undergraduate students in Mechanical engineering.

INTERN | HALLA MECHATRONICS

Jan 2019 – May 2019 | Bay City, MI

- Closed-loop (plant and control) model development, validation & simulation of electronic controllers in motor controls group.

SENIOR ENGINEER | ROBERT BOSCH INDIA

Oct 2015 – Aug 2016 | Bangalore, India

- Simulation expert in the system engineering group (responsible for hybrid systems & E-Mobility).

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, 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 III, 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.
- C. R. Reddy, M. Toub, M. Razmara, M. Shahbakhti, R. D. Robinett, G. Aniba, "Modeling and Optimal Control of Micro-CSP and a Building HVAC System to Minimize Electricity Cost", in ASME 2018 Dynamic Systems and Control Conference, American Society of Mechanical Engineers Digital Collection, pp. V002T28A004.

PROJECTS

ACADEMIC

PhD Course Projects

- Fuel Consumption Reduction Technologies and Hybrid Design
- Control System Development for a Hybrid Automotive 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
- Electrically Assisted Power Steering System Simulation
- Mechanical Design, Fabrication, and Controller Prototyping of Automotive Exhaust Active Noise Cancellation and Enhancement System
- Bosch Boost Recuperation System Simulation
- Proof of Concept and Vehicle Demonstrator of Automobile Waste Heat Recovery System (using Thermo-Electric Generator)

SKILLS

- Modeling, simulation, data analysis, & code generation in Matlab/Simulink.
- Automotive system simulation in GT-Suite, AVL, AMESim, CarSim. And co-simulation with Matlab/Simulink.
- Linear and non-linear control theory. Model-based predictive controller design. Optimization techniques.
- Model, software, and hardware in loop (MiL, SiL & HiL) model development and testing. Tool chains - ETAS, DSPACE, MotoHawk.
- Mechanical CAD. Tools - Solidedge, Solidworks.