Chethan R. Reddy

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♂ Pronoun - He, ☆ Date of birth - 14 Dec 1989, † Citizenship - India, → US VISA CLASS - F1, Available - 17 Aug 2020

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 Aug 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.

TEACHING ASSISTANT | Michigan Technological University
Aug 2017 – Dec 2018 & Aug 2019 - Present | 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).

TEACHING ASSISTANT | National Institute of Technology Karnataka
Jan 2012 – May 2012 | Surathkal, India
- Lab instructor for about 60 students in spring '12. The course focuses on computer aided engineering drawing of mechanical systems, and consists mostly of junior undergraduate students in Mechanical engineering.

SELECTED PUBLICATIONS

- 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, Issue 199, p.111924, 2019.
- **C. R. Reddy** , M. Shahbakhti, M. Razmara, R. D. Robinett III, **"Optimal Exergy-wise Predictive Control for a Combined MicroCSP and HVAC System in a Building"** , in 2019 American Control Conference (ACC), pp. 235-240. IEEE, 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, 2018, pp. V002T28A004-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.
- Model-based predictive control.
- Linear and non-linear control theory.
- Model-based embedded software development tool chains of ETAS, DSPACE, MotoHawk.
- Model in loop (MiL), software in loop (SiL), and hardware in loop (HiL) model development and testing.