Zhong Guo

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PersonalWebsite GoogleScholar LinkedIn

PROFESSIONAL SKILLS

Research Areas:

Reinforcement Learning; Machine Learning; Systems and Control; Optimal Control; Smart Grid; Virtual Energy Storage.

Software/ Programing Languages /OS:

MATLAB and Simulink; Python, PyTorch, and TensorFlow; LaTeX and Microsoft Office; Windows and Linux; PostgreSQL.

Language Proficiency:

English (full professional proficiency); Chinese/Mandarin (native speaker).

EDUCATION BACKGROUND

Doctor of Philosophy, Mechanical Engineering **Jan. 2019 — Dec 2023**

University of Florida, Gainesville, FL

- Thesis: Reinforcement Learning for Optimal Control of District Cooling Energy Plant
- Advisor: Prof. Prabir Barooah. Committee member: Prof. Sean Meyn, Prof. Warren Dixon, Prof. Yu Wang, Prof. Herbert Ingley
- GPA: 3.78/4.0

Master of Science, Mechanical Engineering **Aug. 2017 — May. 2020**

University of Florida, Gainesville, FL

- Focus: Dynamics, Systems, and Control
- GPA: 3.80/4.0

Bachelor of Science, Machinery Design Manufacturing and Automation

Henan Univ. of Sci. & Tech., Luoyang, Henan, China **Sept. 2013 — Jul. 2017**

- Focus: Mechanical Design and Automation
- GPA: 3.70/4.0

RESEARCH & TEACHING EXPERIENCE

Graduate Research Assistant: **Jan. 2019 – Dec.2023**

University of Florida, Department of Mechanical and Aerospace Engineering, DiCE lab, Gainesville, FL

- Finished 4 projects, published 9 papers, and delivered 3 presentations at international conferences.
- Invited to review 10 journal papers and 9 conference papers.
- PhD dissertation saved 10% electricity cost of chiller plants.
- Mentored 1 Master student, leading him to the admission of a Ph.D. program.

Teaching Assistant: **Aug. 2019 – Aug. 2020**

University of Florida, Department of Mechanical and Aerospace Engineering, Gainesville, FL

- Courses:
  1) EML 4312 Control of Mechanical Engineering Systems.

2) EML 4220 Vibrations.
3) EML 4600 Refrigeration and Air Conditioning Fundamentals.

- Assisted professors, held office hours, and evaluated homework and exams. Never received complaints from students, colleagues, and professors.

Lab Database Administrator **Jul 2021 – Dec 2023**

University of Florida, Department of Mechanical and Aerospace Engineering, DiCE lab, Gainesville, FL

- Maintained and updated lab database which is around 1 terabyte.
- Updated and optimized lab database structure.

Volunteer Research Assistant: **Jan. 2018 – Dec.2018**

University of Florida, Department of Mechanical and Aerospace Engineering, DiCE lab, Gainesville, FL

- Helped PhD students with lab projects.
- Work is highly praised by lab mates and academic advisors. Admitted into the PhD program at the same lab.

Undergraduate Research Assistant: **May 2014 – May 2016**

Gear Manufacture and Equipment Center, Henan Univ. of Sci. & Tech, Luoyang, Henan, China

- Worked as team leader in the Student Research Training Program project of "Design of Portable Meshing Tester for High-Speed Small Module Spiral Bevel Gear".
- Concluded the project with a journal paper and a patent. Our team was awarded the first prize.

PROFESSIONAL EXPERIENCE

Student Engineer Intern **Jun. 2016 – Aug. 2016**

Technology Center of Zhengzhou Yutong Bus Co, Ltd, Zhengzhou, Henan, China

- Designed and optimized bus components using CATIA.
- Selected as presenter of our group work in company meetings.
- Participated and facilitated workshops in the company.

Student Engineer Intern **Dec. 2015 – Feb. 2016**

Zhengzhou Yutong Heavy Industries Co, Ltd, Zhengzhou, Henan, China

- Designed and optimized vehicle outfit which reduced the cost by 5%.
- Praised by the team leader and received an intern invitation for the subsequent summer.

PUBLICATIONS

Journals

1. Austin R. Coffman, **Zhong Guo**, and Prabir Barooah, "Characterizing capacity of flexible loads for providing grid support", IEEE Transactions on Power Systems 36 (3), 2428-2437, Oct. 2020.
2. **Zhong Guo**, Austin R. Coffman, Jeffrey Munk, Piljae Im, and Prabir Barooah, "Aggregation and data driven identification of building thermal dynamic model and unmeasured disturbance", *Energy and Buildings 231, 110500*, Jan. 2021.
3. Naren Srivaths Raman, Rahul Umashankar Chaturvedi, **Zhong Guo**, and Prabir Barooah, "Model predictive control-based hierarchical control of a multi-zone commercial HVAC system", *Journal of Engineering for Sustainable Buildings and Cities 2 (2), 021005*, May. 2021.
4. Joseph Rosenberger, **Zhong Guo**, Austin Coffman, Duzgun Agdas, and Prabir Barooah, "An Open-Source Platform for Indoor Environment Monitoring with Participatory Comfort Sensing", *Sensors 23 (1), 364*, Dec. 2022.

5. **Zhong Guo**, Aditya Chaudhari, Austin R. Coffman, and Prabir Barooah, "Optimal Control of District Cooling Energy Plant with Reinforcement Learning and MPC", *ASME Journal of Engineering for Sustainable Buildings and Cities (1-16)*, Nov. 2023.

Conferences

1. **Zhong Guo**, Austin R. Coffman, Jeffrey Munk, Piljae Im and Prabir Barooah, "Identification of aggregate building thermal dynamic model and unmeasured internal heat load from data", accepted at 58th IEEE Conference on Decision and Control, Nice, France, Dec. 2019.
2. Austin R. Coffman, **Zhong Guo**, and Prabir Barooah, "Capacity of flexible loads for grid support: statistical characterization for long term planning", 2020 American Control Conference (ACC), 533-538, Denver, CO, USA, Jul. 2020.
3. **Zhong Guo**, Austin R. Coffman, and Prabir Barooah, "Reinforcement learning for optimal control of a District Cooling Energy Plant", *2022 American Control Conference (ACC), 533-538*, Atlanta, GA, USA, Jun. 2022.
4. **Zhong Guo** and Prabir Barooah, "Reinforcement Learning Based Control of District Cooling Energy Plant with Thermal Storage", *submitted to 2024 American Control Conference (ACC)*.

Leadership and Involvement

Captain of Chinese Soccer Team at University of Florida **Jan. 2020 – Dec. 2023**

- Organized and lead weekly practice games. Held recruitment and farewell events.
- Registered and lead the team playing university intramural tournaments.
- Coordinate with other university divisions regarding team funding and development plans.

SELECTIVE COURSES

All courses listed below are finished with grade letter A

Control System and Reinforcement Learning
Machine Learning and System Control
Control System Theory
Optimal Estimation and Kalman Filter
Nonlinear Control
Non-linear Programming
Analytical Dynamics

HONORS & AWARDS

Outstanding Service as Captain of Chinese Soccer Team at University of Florida	**Dec. 2023**
Achievement Awards Scholarship for New Engineering Graduate Students	**Aug. 2017**
Outstanding Graduate in Henan Province (province-wide award)	**Feb. 2017**
Excellent Student Cadre in Henan Univ. of Sci. & Tech.	**Nov. 2016**
Outstanding Graduate in Henan Univ. of Sci. & Tech.	**Nov. 2016**
National Endeavor Scholarship (nation-wide award)	**Oct. 2016**
Excellent Student Cadre in Henan Province (province-wide award)	**Apr. 2016**
Second prize in China Undergraduate Mathematical Modeling Contest	**Oct. 2015**
PEER Enterprise Scholarship	**Oct. 2014**
Excellent Member of Student Union	**May 2014**