

# Mukesh Ghimire

## Curriculum Vitae

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## Education

2021 - Now Ph.D. in Mechanical Engineering at **Arizona State University**

- Advisors: Yi Ren, Zhe Xu
- Research Topics: Incomplete Information Games, Reinforcement Learning, HJI PDEs.

2016 - 2021 B.Sc.(Hons) in Mechanical Engineering at **University of Mississippi**

- GPA: 3.98/4.00
- Minors: Computer Science and Mathematics
- Thesis: A Study of Deep Reinforcement Learning in Autonomous Racing Using DeepRacer Car.

## Publications

### Journal Publications

1. Zhang, L., M. Ghimire, W. Zhang, Z. Xu, and Y. Ren (2024). Value Approximation for Two-Player General-Sum Differential Games with State Constraints. In: *To Appear in IEEE Transactions on Robotics*.

### Conference Proceedings

2. Ghimire, M., L. Zhang, Z. Xu, and Y. Ren (2024). State-Constrained Zero-Sum Differential Games with One-Sided Information. In: *International Conference in Machine Learning (ICML)*.
3. Ghimire, M., L. Zhang, W. Zhang, Y. Ren, and Z. Xu (2024). Solving Two-Player General-Sum Games Between Swarms. In: *2024 American Control Conference (ACC)*. IEEE.
4. Zhang, L., M. Ghimire, Z. Xu, W. Zhang, and Y. Ren (2024). Pontryagin Neural Operator for Solving Parametric General-Sum Differential Games. In: *Accepted to L4DC*.
5. Zhang, L., M. Ghimire, W. Zhang, Z. Xu, and Y. Ren (2023). Approximating discontinuous nash equilibrial values of two-player general-sum differential games. In: *2023 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE, pp.3022–3028.
6. Amatya, S., M. Ghimire, Y. Ren, Z. Xu, and W. Zhang (2022). When Shall I Estimate Your Intent? Costs and Benefits of Intent Inference in Multi-Agent Interactions. In: *2022 American Control Conference (ACC)*. IEEE, pp.586–592.

## Teaching

- Teaching Assistant (TA) for the graduate course *MAE 502 Partial Differential Equations* in the Department of Mechanical and Aerospace Engineering at ASU (Spring 2024). Instructor: Huei-Ping Huang.
- Teaching Assistant (TA) for the graduate course *MAE 547 Modeling and Control of Robots* in the Department of Mechanical and Aerospace Engineering at ASU (Spring 2022 & Fall 2023). Instructors: Wanxin Jin and Hyunglae Lee.

## Honors and Awards

2023 GPSA Travel Fund Award: \$950.00

2023 Experiential Learning Grant: \$1015.00

2020 SMBHC Research Fund Award: \$1000.00

## Invited Talks

(excludes contributed paper presentations at conferences)

- Invited Talk at Sparky's Cup Education (October 2022) on the topic *Game-Changing AI Applications in Sport: Maximizing Potential and Minimizing Risk*

## Internships

2019 - 2020 Product Development Intern at **Thyssenkrupp Elevator Manufacturing**

- Successfully reduced manufacturing costs of the elevator cab by 10% through process improvements.
- Developed over 100 Configure-To-Order(CTO) prints using Creo while adhering to the customer and regulatory requirements.
- Reduced data pre-processing time for sheet metal shearing jobs by more than 50% through implementing an automated process using Python.

## Relevant Courseworks

Game Theory, Causal Inference, Stochastic Processes, Convex Optimization, Advanced Modern Control, Numerical Methods for PDEs, Reinforcement Learning, Multi-Robot Systems.

## References

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