AMISHA BHASKAR

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EDUCATION

- **University of Maryland, College park** MD, USA
  PhD - Computer Science *August 2022 - Present*
- **Netaji Subhas Institute of Technology, University of Delhi** Delhi, India
  B.E - Manufacturing Processes and Automation; CGPA: 8.36/10 *August 2018 - July 2022*

RESEARCH INTERESTS

Reinforcement Learning, Imitaion Learning, Assitive-Robotics, Manipulation, Mobile-manipulation

Publications

- **Amisha Bhaskar**, Z Mahammad, SR Jadhav, P Tokekar ***NAVINACT: Combining Navigation and Imitation Learning for Bootstrapping Reinforcement Learning***, (Under review)
- **Amisha Bhaskar**, R Liu, VD Sharma, G Shi, Pratap Tokekar ***Lava: Long-horizon visual action based food acquisition***, Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2024) (Won **Best** Paper at International Conference on Robotics and Automation Workshop on CookingRobot, ICRA 2024)
- N Karapetyan, AB Asghar, **Amisha Bhaskar**, G Shi, D Manocha, P Tokekar ***AG-Cvg: Coverage Planning with a Mobile Recharging UGV and an Energy-Constrained UAV***, Proceedings of the IEEE/RSJ International Conference on Robotics and Automation (ICRA 2024)
- Rui Liu, **Amisha Bhaskar**, P Tokekar ***Adaptive Visual Imitation Learning for Robotic Assisted Feeding Across Varied Bowl Configurations and Food Types***, International Conference on Robotics and Automation Workshop on CookingRobot (ICRA 2024)
- Souradip Chakraborty, **Amisha Bhaskar***, Anukriti Singh*, Pratap Tokekar, Dinesh Manocha, and Amrit Singh Bedi ***REBEL*: A Regularization-Based Solution for Reward Overoptimization in Reinforcement Learning from Human Feedback** , (Under review)
- Rui Liu, Zahiruddin Mahammad, **Amisha Bhaskar**, P Tokekar ***IMRL: Integrating Visual, Physical, Temporal, and Geometric Representations for Enhanced Food Acquisition***, (Under review)
- **Amisha Bhaskar**, S Dantu, S Roy, J Lee, S Baldi ***Adaptive Artificial Time Delay Control for Bipedal Walking with Robustification to State-dependent Constraint Forces***, Proceedings of the IEEE/RSJ 20th International Conference on Advanced Robotics (ICAR 2021) (oral)
- **Amisha Bhaskar**, Gaurav Verma, Satvik Sharma ***MARVEL: A High Pitch Agile Bi-copter Wall-Climbing Robot***, Proceedings of the ACM International Conference on Advances in Robotics (AIR 2021) (oral)

Projects

- **Push-recovery of bipedal walking using Reinforcement Learning**- working on push-recovery and fall-recovery of bipedal walking by using the method of trajectory generation by RL and adaptive-sliding control to minimize the epochs.
- **Quadraped locomotion on uneven terrain**- studied and implemented different controllers like MPC, adaptive-robust control, Time-delay control, for the locomotion of quadrapedal on uneven surface.
- **Warehouse management Using Robots**- Modelled a compact wheeled bipedal robot that is able to move quickly on flat terrain and overcome obstacles by jumping, equipped with an attached arm to explore the capabilities of pick and place operations. Also, created multi-robot warehouse environment to simulate a warehouse with moving robots and delivering requested goods.

Experience

- **University of Maryland** MD,USA
  Graduate Teaching Assistant *Fall 2022, Spring 2023, Fall 2023*
  - **ENEE 322**: Helping undergraduates with the concepts and tools for signal analysis

- **PerceptionAI**
  Co-founder *September 2022 - October 2023*
  - **Machine Learning, Large language Models, Full-stack development**: Build Perception AI - A Co-Pilot for PMs to get their day to day tasks done in real time.
  - **Impact**: The tool was designed to help Product Managers Get impactful insights from voice of customer channels, analytics and Internal Database straight to their slack. Which helps Product Managers speed up their process by 10x and Save millions of dollars on mundane tasks. Build better products with insights and increase user retention, loyalty, acquisition and reduce customer support tickets

- **OYO** Remote
  ML Engineer *March 2022 - August 2022*
  - **Machine Learning**: Created whole pipeline for revenue generation and prediction for OYO South-east Asia hospitality with 92% accuracy
  - **Impact**: Managed team of 5 and automated the whole customer support ticket pipeline which paced up the flow by 10X

- **Hybrid Robotics Lab - UC Berkeley** Remote
  Research Intern *October 2021 - December 2021*
  - **Reinforcement Learning**: Implemented teaching policy for domain adaptation on rabbit robot
  - **controls**: Worked of CBF-CLF-QP control for locomotion of rabbit

- **Robotics Research Centre Lab (IIIT-H)** Remote
  Research Intern *August 2020 - July 2021*
  - **Design** : Designed the CAD model of 15 DoF robotic hand and 25 DoF Humanoid robot using Solidworks.
  - **Dynamics**: Learned and derived the Euler-Lagrange dynamic modelling of robotic hand and biped robot.
  - **Controls**: Implemented non-linear adaptive controllers like- Adaptive-Robust Time Delay Control, Adaptive Time Delay Control, Adaptive Sliding Mode Control and Model Predictive Control on robotic hand as well as Bipedal robot.
  - **Reinforcement Learning**: Learned and implemented gait adaptation using learning methods for fall prevention of bipedal robot under uncertainties.

- **Breathe Digital B.V.(Netherlands)** Remote
  Technical Research Intern *March 2020 — July 2020*
  - **Design and Simulation**: Designed the CAD model of food delivery drone using Solidworks and performed static and flow analysis of the model on ANSYS, later made it compaible for gazebo
  - **Dynamics**: Modelled and implemented web tension mechanism and it's control for the cable suspended delivery system. Developed the complete pipeline in pybullet.

- **INMAS(DRDO)** Delhi,India
  Technical Research Intern *May 2019 — Jan 2020*
  - **Design and Simulation and fabrication** : Designed the CAD model of **Meal Assistance robotic arm**(to aid physically unpriveleged) and **Upper-limb Exoskeleton**(to aid carrying heavy machinery) using Solidworks and performed static analysis of the model on ANSYS.
  - **Dynamics and control**: Derived Euler-Lagrange dynamic model of both the models and implemented **force-impedance velocity control**. Developed the complete pipeline on pybullet(python simulator)

- **Momentum Robotics** Pune, India
  Technical Intern *August 2020 — September 2020*
  - **Designed Signature Product**: Designed the CAD model of autonomous Mobile robot for heavy-duty warehouse logistics using Solidworks and performed finite element analysis of the model on ANSYS accompanied with urdf modelling for system to be compatible with ROS for autonomy.

Other Experiences

Team ARES - NSIT, India
Mechatronics Head *January 2020 - Present*

- **Design and fabrication**: Led the team of 10 to design and fabricate every component of rover ranging from robotic arm to suspension for the rover Pegasus (WON first runner up position in International Rover Design Challenge, 2020) along with several otherrover competitions
- **Dynamics and Controls**: Implemented inverse dynamic control and integrated it on the hardware.

Team Daedalus Racing
CAE Head *September 2018 — July 2019*

- **Design**: Led the team of 15 to design and develop All Terrain Vehicle for FMAE BAJA 2019 and 2020.
- **Simulation**: Worked in a team of 4 to perform finite element analysis of the model usinf ANSYS.

Volunteer Experiences

ENACTUS
Product Developmet Head *September 2018 — July 2021*

- **Aahar**: We designed and developed a new method of Hydroponic System to increase revenus of farmers and received grant of 10,000 dollars from the Delhi governement.
- **Sanjeevani**: Designed and developed cost effective air-purifier to tackle air pollution in Delhi and provide sustainable business model to unemployed women in slums.
- **Drinking Water**: Designed and developed cost effective water-filter to clean drinking water to a community of around 300 people in Slum areas of Delhi.

HONORS AND AWARDS

- **Best Paper Award** in Cooking Robotics Workshop at **ICRA 2024**
- Won **U.S. National Science Foundation's Innovation Corps (I-Corps™) Grant 2024**
- Won **Jacob K. Goldhaber Travel Grant 2024**
- Received **IROS 2024 Travel Grant**
- Won **International Conference Student Support Award (ICSSA) Grant 2024**
- Received **Computer Science Department Travel Grant 2024**
- **Key-note Speaker** in Cybosium IEEE RAS SBC MACE (2023) Gave a lecture on Kinematics, Dynamics and Controls of Unmanned Aerial Vehicle
- **Runner-Up** in Rover Design Challenge (2020) among 7 countries for designing fully equipped Mars rovers and mission ready for operation on Mars
- **World-cup finalist** ENACTUS, 2021 among 36 countries.
- **University Rover Challenge finalist, 2021** among 7 countries.
- **Second Runner-Up** in FMAE BAJA 2019
- Won **KPMG grant 2020** for project sanjeevani.
- Won **Ford grant 2020** for project Covid-App.
- Won **27th international** , **3rd state rank** and **1st class rank** in level 2 of International Informatics Olympiad (IIO) Silver zone in class XII