Umeshkumar Ghaskata

umeshghaskata2001@gmail.com
+1 (716) 580-0523
Gender: Male | DOB: 09/09/2001
Location: Buffalo, NY, USA

Examination	University	Major	Year
Post Graduation	University at Buffalo	Computer Science(Master of Science)	2026
Graduation	IIT Bombay	Aerospace Engineering(B.Tech)	2024

PROFESSIONAL SUMMARY

- A highly motivated AI Software Engineer and Computer Science graduate student at the University at Buffalo, with a strong foundation in ML/DL, Robotics, and Python/C++ programming. Experienced in developing AI-driven solutions, optimizing UAV path planning, and implementing ML models. As a Research Assistant at the Drone Lab, I worked on energy-efficient autonomous systems. Passionate about leveraging technical expertise to drive innovation in AI, Robotics, and Software Development.

TECHNICAL SKILLS

Languages	C++, Python, SQL, HTML, CSS, JavaScript
Technologies	Linux, RestAPI, Machine Learning, AI, Deep Learning, Robotics, ROS, Git
Frameworks	Flask, Django, Scikit-learn, TensorFlow, PyTorch, Keras, OpenCV, NumPy, SciPy, Pandas, Matplotlib, Seaborn
Robotics Tools	ROS (MoveIt, tf, SLAM Toolbox), URDF, Rviz, OMPL, PCL, Open3D, Gurobi, CVXPY, PX4, MAVSDK, CMake, Gazebo, Unity, Unreal Engine,EKF

RESEARCH EXPERIENCE

SUNY Research Foundation | DRONES LAB [Jan'2025–Present]
Prof. Karthik Dantu, Dept. of Computer Science

- Conducting research on energy-efficient **coverage path planning** by integrating **Graphs of Convex Sets** (GCS) and smooth trajectory generation using **D-C optimization**.
- Developed and implemented enhanced trajectory planning algorithms in obstacle-filled environments, achieving an estimated **20–30% energy savings** over traditional methods.
- Validated the proposed methods in simulation using real-world contributing to future deployments in surveillance and search-and-rescue operations.

Coordinated UAVs for Efficient Agricultural Spraying Operation | Summer Intern[May'2023 - Aug'2023]
Prof. Arpita Sinha, Department of Systems and Controls Engineering

- **Modeled a grid-based path planning** algo for UAV-based spraying, optimised **cost and time efficiency**
- Generate 2D-Grid map using **OpenCV, matplotlib and HSV** library from heat-wave based on intensity
- **Implemented the Traveling Salesman Problem**(**TSP**) to obtain an optimized sequence of waypoints
- **Perform simulation using python** to implement **A* and dijkstra** Algorithm on sequencial waypoints

PROFESSIONAL EXPERIENCE

Scitara Corporation | Software Developer Intern [Dec'2022-Feb'2023]
Mumbai, India

- Implemented a virtual server response to mock RESTful API responses, improving testing efficiency and reducing server response time
- Developed JSON responses using GET-POST, streamlining testing by waiving credential requirement
- Code multiple responses for different **query** & Implemented **Docker** using CLI for efficient deployment

KEY PROJECT

Autonomous Drone | Institute Technical Summer Project [May'2022-Jul'2022]
Institute Technical Council, IIT Bombay

- **led** a team 4 on the developement of a **Autonomous Drone** designed for **inaccessible** search operation
- Implement **ML**,**Open-CV library** and **Flask** using the pre-trained **HOG** detector for **Human Detection**
- Installed **Pixhawk** and **R-Pi** for Code Python to Arm and Takeoff, and use **Rpi Camera** for video feed
- Apply **A* Algorithm** for **path planning** and Intigrate Ultrasonic sensor for **object detection/avoidance**

Hands-On Machine Learning Projects | Machine Learning Course [Aug'2024-Nov'2024]
Course Project - CSE574 - SUNY Buffalo

- Built a logistic regression model from scratch on the raw dataset without using any library like sklearn, by implementing **gradient descent, sigmoid activation**, and **cost function** to build a binary classifier. **Optimized learning rate** (1e-3), iterations (100,000) and **L2 regularization** to achieve **accuracy** >80%
- **Designed and trained** a fully connected **NN and CNN** in **PyTorch** for multiclass classification. Enhanced performance by **tuning hyperparameters** on hidden layer, Activation Function. Improved model by **dropout, batch normalization, and learning rate scheduling** to Achieve >85% accuracy.
- Created a grid-world **RL environment** following **Gymnasium** standards, defining states, actions, rewards, and transitions for a **MDP**. Implemented **SARSA and Double Q-learning** to maximize rewards

---

Bollywood Celebrity Prediction| Image Processing [May'2022-Jun'2022]
Collaboration with Mood Indigo, Indian Institute of Technology, Bombay

- Developed a facial recognition project utilizing ML libraries such as **TensorFlow, Keras, and VGGFace**
- Implemented **feature extraction using the MTCNN library** for face detection, VGGFace model with **ResNet50 architecture** for feature embedding and **pickle** to store serialize 2048-feature **NumPy array**
- Utilized the **TensorFlow framework** for image loading and manipulation for image model processing
- Developed a **streamlined web user interface** using **Streamlit** for uploading images and obtain output

---

Data Structure and Algorithms | Summer of Science [May'2022-Jul'2022]
Maths and Physics Club, Institute Technical Council, IIT Bombay

- Developed an interactive site utilizing JavaScript and CSS animations for **visually explain** algorithms
- Implement various Algorithms and Data Structures for implementation in **Competitive Programming**
- Analyzing and Implementing basic algorithmic techniques and ideas for problems arising frequently in **practical** applications: sort and search, divide and conquer, greedy algorithms, dynamic programming

---

OS Programming Assignments | Course Assignment [Jan'2022 - May'2022]
Prof. Mythili Vutukuru, Dept of Computer Science, IIT Bombay

- Solved three programming assignments related to concepts covered in a course on Operating Systems
- Built a **simple shell** using **fork**() **,wait**() and **exec**() family of system calls and also handle dedge cases
- Developed **CLI** using new **system calls** and implemented memory management technique(DP) in **xv6**
- Implemented **semaphore** by employing **pthread,mutexes** and **condition** variables for **synchronization**

SCHOLASTIC ACHIEVEMENTS

- Achieved **99.29**% in JEE(India's Most Competitive Exam) Mains amongs 1.3 million candidates [2020]

POSITIONS OF RESPONSIBILITY

Institute Technical Convener-Aeromodelling Club|IIT Bombay [May'2021- Jul'2022]

- Part of a 10-member team in charge of **ideating, organising and executing** events and competitions
- Delivered a self - made course on **Aircraft design and stability analysis** to the 60+ undergraduates
- Recruit a team of 4 members by organizing the sessions aimed to explain my Drone project objective
- Organized RC plane competition, Delivered RC plane design session, assemble 8-10 Fixed-wing UAV

Web-Developer, Rocket Team, IIT Bombay | Patronage from ISRO [Feb'2022-Jul'2022]

- Developed and maintained responsive website utilizing **HTML, CSS Grid, CSS Flex, CSS Animation**