# Sai Bharadhwaj Matha

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## About

An ingenious engineer with two years of experience in embedded systems and power electronics for UAVs and one year as a research assistant in computer vision and deep learning. I am pursuing a Master of Engineering in Artificial Intelligence, focusing my thesis on Semantic Occupancy Prediction. I am passionate about advancing my career in AI, computer vision, and intelligent robotics, striving to contribute to cutting-edge innovations.

## Education

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| 2022 – present<br>Cham, Germany | **Master of Engineering in Artificial Intelligence for smart sensors and actuators**<br>*Technische Hochschule Deggendorf.*<br>GPA: 1.6<br>Thesis: Real world Semantic Occupancy Prediction for Advanced Aerial Mobility |
| 2016 – 2020<br>Rourkela, India | **Bachelor of Technology in Electrical Engineering**<br>*National Institute of Technology Rourkela.*<br>CGPA : 8.72/10.0 |
| 2014 – 2016<br>Visakhapatnam, India | **Higher Secondary Education**<br>*Board of Intermediate Education AP, India.*<br>Percentage: 98.4 |
| 2002 – 2014<br>Rajam, India | **Secondary Education**<br>*Board of Secondary Education Andhra Pradesh*<br>GPA : 9.7/10.0 |

## Professional Experience

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| 2024 – present<br>Ingolstadt, Germany | **Research Assistant**<br>*Fraunhofer IVI*<br>• Conducting thesis research focused on semantic occupancy prediction for UAVs.<br>• Expertise in computer vision, deep learning, and UAV avionics. |
| 2023 – 2024<br>Ingolstadt, Germany | **Internship**<br>*Fraunhofer IVI*<br>• Developed a pipeline for 3D semantic point cloud generation |
| 2020 – 2022<br>Mumbai, India | **Embedded Systems Engineer**<br>*Ideaforge Technology Private Limited.*<br>• Aided circuit design and firmware development of UAV avionics.<br>• Developed an FOC-based ESC for BLDC motors.<br>• Developed Li-ion and Li-Po battery pack charging system. |
| 2019 – 2019<br>Pune, India | **Internship**<br>*Hachimichi Technology Private Limited.*<br>• Firmware for automation of a toilet seat.<br>• Heart rate monitoring on a toilet seat. |

## Projects

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| 06.2024 – 12.2024 | **Semantic Occupancy Prediction for Advanced Aerial Mobility**<br>*Master Thesis*<br>• Developed a novel benchmark semantic occupancy dataset for UAVs.<br>• Developed a novel data generation pipeline incorporating 3D reconstruction, pose estimation, semantic fusion, dense voxelization, and mesh generation techniques. |

- Trained SOTA occupancy prediction model architectures on the generated dataset.

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| 11.2023 – 02.2024 | **3D semantic point cloud generation** |

- Dense 3D point cloud generation using Structure from Motion (SfM) and Multi-View-Stereo (MVS) pipeline.
- Semantic mask generation using SOTA UperNet and SegFormer-based semantic segmentation models followed by novel fusion techniques.
- Expertise in COLMAP and Agisoft Metashape tools, OpenCV and Open3D libraries.

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| 03.2023 – 06.2023 | **Window Detection and Classification system** |

- Window state classification on a live feed using YOLOv5 and a custom naive deep learning model pipeline on Jetson Xavier.

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| 09.2021 – 03.2022 | **UAV SLAM** |

- The objective is to develop a GPS-denied navigation system for UAVs using a depth and thermal camera, computer vision, and the ORB SLAM3 algorithm.

## Skills

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| **Python** — Proficient | **Machine Learning and Deep Learning** — Proficient |
| **Computer Vision** — Proficient | **PyTorch** — Proficient |
| **ONNX, TensorRT** — Competent | **Generative AI** — Competent |
| **Kubernetes, Git** — Competent | **Docker** — Competent |
| **C,C++** — Competent | **SQL** — Competent |
| **Robot Operating System(ROS)** — Competent | **STM32, RTOS** — Competent |
| **Linux** — Competent | **Data Structures** — Competent |

## Languages

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| **Telugu** — Native/Bilingual<br>*Mother Tongue* | **Hindi** — Native/Bilingual<br>*National Language* |
| **English** — Native/Bilingual<br>*IELTS score: 8.0/9.0* | **German** — Basic |

## Courses & Certificates

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| **Big Data**<br>*Issued by Coursera* | **Quantum Computing**<br>*Elective from THD* |
| **MLOps (AWS): Deploying AI & ML Models**<br>Issued by edX | |

## Interests

- Cooking and blogging
- eFootball and gaming

## Organisations

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| 2019 – 2020<br>Rourkela, India | **VS Hall of Residence**<br>*Student elected representative* |
| 2017 – 2020<br>Rourkela, India | **Plugged_IN**<br>*Vice President* |

## Declaration

I affirm that all information provided is true and accurate to the best of my knowledge.

*M. Sai Bharadhwaj.*

23.12.2024