Mangal Deep B.M

M.Eng. Embedded Systems for Mechatronics

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Knowledge & Skills	**Domain Knowledge:** Machine Learning | Robotics | Sensor Fusion | OOPS | Control System analysis & design | Brain Machine Interface | Model Based Development **Frameworks / Tools:** PyTorch | Pandas | Scikit | Dash | MATLAB | Simulink | Stateflow | E-Coder | TargetLink | Git | ROS | CARLA **Testing Tools:** dSpace | Vector **Languages:** Python | VBA | M script | Markdown **Protocols:** CAN | LSL
Education	
10/2019 - present	**Master in Embedded Systems for Mechatronics (M.Eng), FH Dortmund, Dortmund, Germany.** Focus: Robotics, Machine Learning, Embedded systems, Systems engineering, Control systems, Autonomous systems and driving.
07/2011 - 05/2015	**Electrical and Electronics Engineering (B.Tech), Amrita University, Coimbatore, India.** Focus: Electric Machines, Power Systems, Digital Systems, Power Electronics, Electronic and Instrumentation. Publications: Smart Soldier assistance using Wireless Sensor Networks (ICES-2014)
Experience	
05/2022 - present	**Work Student, HELLA Aglaia Mobile Vision GmbH, Berlin, Germany.** · Development of python-based dashboard for visualizing and analyzing performance metrics of people sensing algorithms. · SiL automation on standalone machines and on Jenkins server to facilitate continuous integration and continuous delivery (CI/CD).
09/2021 - 05/2022	**Research Assistant, FH Dortmund, Dortmund, Germany.** · Creation of code packages and stubs of several robotic algorithms as assignments for undergraduate students.
03/2020 - 03/2021	**Work Student, APTIV Technologies, Wuppertal, Germany.** · Develop MATLAB based validation tool for SRR5 RADARS- ADAS. · Creation of test scenarios using dSpace Model Desk, Motion Desk and Automation Desk. · Developed several automation scripts for an effective workflow.
02/2019 - 09/2019	**Advanced Engineer, ALTRAN Technologies, Coimbatore, India.** · Team leader and mentor for a team of 7, to design and develop BCM hosted applications for electric vehicles using Agile software development methods and practices. · The system performs diagnosis of various chassis and driveline components to warn the driver and other systems on detecting faults.

07/2015 - 01/2019	**Senior Software Engineer, KPIT Technologies Ltd., Bangalore, India.** · Requirement gathering, requirement analysis, control algorithm development, auto code generation, MiL, SiL and HiL testing of the Auto Terrain Response and Auto Driver Advice application for JLR using V-model SDLC. · Developed AUTOSAR wrapper and supporting models to host the application on DADC module.
02/2017 - 01/2018	**Software Engineer, Jaguar Land Rover Ltd. (KPIT), Gaydon, UK.** · As onsite coordinator performed requirement gathering, requirement analysis, control model development for Auto Terrain Response and Auto Driver Advice Application control modules. · Key role in requirement gathering and hosting the applications on different ECU platforms. · Developed test vectors for Air Suspension application to test on dSpace closed loop simulators.
Certifications	Control Systems | Control System Design | Programming, Data Structures and Algorithms in Python | Electric Vehicles Part-1 | Machine Learning for Engineering and science application, *IIT Madras* Neural Networks and Convolutional Neural Networks Essential |OpenCV for Python Developers, *LinkedIn* Self-Localization and Mapping, *Coursera*
Projects	**Implementation and Comparison of Scan Matching algorithms with particle filter based SLAM using CARLA (Research Thesis)** A full python implementation of Scan Matching algorithms (ICP-LS, RTCSM) for a particle filter-based SLAM application run and verified on data obtained from an open-source simulator, CARLA. The data obtained from LiDAR, Odometry were used to create a global map of the environment and verified against the map created from using GNSS. **Brain-Computer Interface controlled simulated car in CARLA (Master Thesis)** The research involves implementation of classical signal processing and analyzing techniques as well as state-of-the-art deep learning and deep reinforcement learning techniques to capture the motor intent of a user wearing non-invasive 16 channel EEG electrodes and navigate a simulated car in the CARLA simulator. The electrodes are used to record electrical activities on the scalp from the brain and a pipeline of classical filtering, artifact removal, signal processing, feature extraction, feature selection techniques are used to extract relevant motor imagery (MI) information from the user's brain and the motor intent of the user is classified with classical machine learning classifiers such as LDA and SVM. The same was achieved with a deep convolutional neural network. Deep reinforcement learning is used to improve the accuracy of the CNN, by feedback to the user. The algorithms were first implemented and trained on open-source datasets and tuned to suit data from OpenBCI headgear.
Language	English (Professional) | Tamil (Native) Kannada (Fluent speaker) | Deutsch (B1) (Intermediate)
Hobbies	Bouldering | Fitness | Cooking