



Ekagra Gupta

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WORK EXPERIENCE

01/04/2023 – CURRENT Stuttgart, Germany

STUDENTISCHE HILFSKRAFT (M/W/D) IN DER FORSCHUNG FRAUNHOFER IPA

- 12 hours/week
- Developing a crisis management platform for producing companies and supply chains with **machine learning models and methods** to monitor and forecast transport and delivery routes.
- Leveraged Google Maps API to extract and analyze transportation-specific route segments.

01/02/2023 – CURRENT Stuttgart, Germany

WERKSTUDENT (M/W/D) IM BEREICH (E)POWERTRAIN DAIMLERTRUCKS AG

- 08 hours/week
- Performing data-driven engine mount analysis with Simpack and Python.
- Utilizing Visual Basic Analysis (VBA) and Simpack to manipulate Simpack models.
- Applying machine learning algorithms to predict high-frequency load collective data.

01/11/2022 – 01/03/2023 Stuttgart, Germany

STUDENT LOCALISATION AND MAPPING ENGINEER GREENTeam UNI STUTTGART E.V.

- 20 hours/week.
- As a part of the collegiate Formula Student Electric Team, I contributed to the development of a driverless race car for international competitions.
- My responsibilities included estimating the vehicle poses using perception data, developing the vehicle's localization using C++ and ROS2, and mapping using the landmark-based pose-graph method.

Department Driverless Vehicle

17/01/2022 – 17/09/2022 Stuttgart, Germany

WISSENSCHAFTLICHER MITARBEITER DER UNIVERSITÄT UNIVERSITÄT STUTTGART

- 20 hours/week.
- Designing Equivalent Circuit Models of Li-ion batteries using MATLAB/Simulink.
- Conducted estimation of SOC and SOH degradation of a cell using various algorithms.
- Characterized Li-ion cells at different temperatures and parameterized them using the DRT of synthetic EIS data.

Department Institut für Photovoltaik IPV

EDUCATION AND TRAINING

18/10/2021 – CURRENT Germany

MASTERS IN SCIENCE University of Stuttgart

Main Subjects covered:-

- Digital Image Processing, Detection and Pattern Recognition, Advanced Mathematics for Signal and Information Processing, Deep Learning, Statistical and Adaptive Signal Processing, Software Engineering for Real-Time Systems, Industrial Automation Systems, and Battery Modelling and Energy Management

Master Lab course:-

- MRT Hardware Design

Website www.uni-stuttgart.de | **Field of study** Electrical Engineering (Smart Systems) | **Final grade** 2.5*

Main Courses:

- Digital Signal Processing
- Signals and Systems
- Microwave Engineering
- Mathematics subjects.

Website www.mait.ac.in | **Field of study** Electronics and Communication Engineering | **Final grade** 8.9

DIGITAL SKILLS

Software skills

TensorFlow for Deep learning | Python | MATLAB | VBA | C++ | Pytorch | Data Preprocessing | Pattern recognition | Data Visualization

Designing

Gazebo | CST design studio | AUTODESK Fusion360 | Solidworks | CubeIDE | SIMPACK | Electric Powertrain | Arduino IDE | MATLAB/Simulink

Other Skills

Microsoft Office (all) | adversarial machine learning

Platforms

Flask | StreamLit

Operating Systems

Linux | ROS2 (Robot Operating System)

ADDITIONAL INFORMATION

FORSCHUNGSARBEIT

17/03/2023 – 31/08/2023

Structured Comparison of Metrics to Evaluate the Robustness of Image Classification Models

- Conducted in-depth research on Image classifier vulnerabilities, focusing on adversarial examples and their potential security implications.
- Developed and employed robustness measurement metrics contributing to the quantification of model resistance against adversarial attacks.
- Introduced a novel **Early Stopping Projected Gradient Descent Attack** algorithm utilizing CleverHans Library, contributing to the advancement of techniques for assessing model robustness in adversarial contexts.
- Demonstrated the intricate interplay between model architecture, training methods, and robustness metrics, emphasizing the importance of comprehensive evaluations for ensuring the reliability of image classifiers in adversarial scenarios.

Link <https://github.com/EkagraGupta/ResNet50-Adversarial-CiFar10-PyTorch>

PROJECTS

Core Learning Algorithms Application of core learning algorithms to get an understanding of common machine learning algorithms using purely TensorFlow.

Link github.com/EkagraGupta/CoreLearningAlgorithms

Classification (Transfer Learning)

- The project involved utilizing the MNIST and Fashion-MNIST datasets to create a CNN architecture for classification.
- Additionally, Transfer learning was implemented using MobileNetV2 on the same datasets using Tensorflow.

Link github.com/EkagraGupta/Classification-Transfer-Learning

DCGAN-Model

- A DC-GAN model was developed using Keras Sequential API for generating image data.
- The model consists of both Discrimination and Generator components for the MNIST dataset.

Link github.com/EkagraGupta/DCGAN-Model

Age-Regression Model Designing an Age Regression Neural Network architecture using Convolutional Neural Networks.

Link github.com/EkagraGupta/AgeRegressionModel.git

01/03/2021 – 15/07/2021

F450 Quadcopter (Major Project) The project objective was to construct a stable Quadcopter that possesses F450 traits and has the ability to transport a CO₂-containing package, such as a fire extinguisher, to the site of an emergency.

01/10/2020 – 02/11/2020

Ultra Wideband Antenna (Minor Project) Circular polarization was the objective for an ultra-wideband antenna, which was simulated using CST Microwave Studio.

PUBLICATIONS

Design of Circularly polarized irregular octagonal shaped and dumbbell slotted planar and conformal patch antenna

– 2021

- The paper presents a simulation study on circularly polarized planar and conformal patch antennas with irregular octagonal and dumbbell slot shapes.
 - The objective was to achieve a satisfactory impedance mismatch bandwidth and axial ratio bandwidth.
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SCI-21025379

LANGUAGE SKILLS

English

Business fluent (C1)

German

Basic user (A2)