Ekagra Gupta

Date of birth: 01/03/1999 | **Nationality:** Indian | **Gender:** Male | **Phone number:** (+49) 15758489284 (Mobile) | **Email address:** ekagrag99@gmail.com | **Website:** https://ekagragupta.github.io/ | **LinkedIn:** linkedin.com/in/ekagra-gupta-119003177 | **Github:** https://github.com/EkagraGupta |

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PUBLICATIONS

2024

Towards a Practical Evaluation of Adversarial Robustness of Machine Learning Classifiers

- Developed a comprehensive method to assess the adversarial robustness of machine learning image classifiers.
- Estimated upper and lower bounds of adversarial distance through iterative attacks and certification approaches.
- Included visualizations and ablation studies to provide insights into evaluation methodologies and parameter settings.
- Demonstrated effective adversarial attack implementation, with noted limitations in the certification method.
- Contributed to more informative evaluations of classifier robustness in real-world applications.

in proceeding (IMECE 2024)

2021

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

- 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.

Link https://scientiairanica.sharif.edu/article_22591.html

WORK EXPERIENCE

01/11/2023 – 30/04/2024 Renningen, Germany

PRAKTIKUM - EVALUATION AND ANALYSIS OF TOOLS FOR PERCEPTION MODELS BOSCH CENTER FOR ARTIFICIAL INTELLIGENCE

- Applied common corruptions and instance manipulations, including consistent object scaling, to the nuScenes dataset for autonomous driving.
- Ensured instance manipulation maintained consistency with one object per scene, based on provided masks for all objects.
- Evaluated the altered nuScenes dataset using StreamPETR, FAR3D, and both static and temporal configurations of FIERY models to analyze their behavior and identify corner cases.

01/02/2023 – 31/10/2023 Stuttgart, Germany

WERKSTUDENTTÄTIGKEIT IM BEREICH (E)POWERTRAIN DAIMLERTRUCKS AG

- 08 hours/week
- Improving the simulation software, focused on MoLaSim, an in-house tool utilized for fundamental engine mount analysis.
- Through VBA scripting to enhance analysis capabilities and user interface, the software was upgraded, resulting in a more sophisticated and user-friendly tool that has brought tangible benefits to the team.
- The data and model export process in Simapck (a multi-body simulation tool) was streamlined and optimized through the creation of custom Python scripts, enhancing efficiency and data accuracy in daily operations.

01/04/2023 – 30/09/2023 Stuttgart, Germany

STUDENTISCHE HILFSKRAFT FRAUNHOFER IPA

- 12 hours/week
- Utilized public data sources for model training and collaborated on Python-based dashboard implementation for transport route monitoring, expanding its functionalities, and documenting results comprehensively.
- Independently developed an innovative approach for route planning.

01/11/2022 – 01/03/2023 Stuttgart, Germany
STUDENTISCHE HILFSKRAFT 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
STUDENTISCHE HILFSKRAFT 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 Stuttgart, Germany
MASTERS IN SCIENCE Universtiy of Stuttgart

Main Subjects covered:-
- Detection and Pattern Recognition, Advanced Mathematics for Signal and Information Processing, Deep Learning, Software Engineering for Real-Time Systems, Industrial Automation Systems, 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** 2.4*

01/08/2017 – 01/06/2021 India
BACHELOR OF TECHNOLOGY Guru Gobind Singh Indraprastha University (MAIT)

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

FORSCHUNGSARBEIT

17/03/2023 – 31/08/2023
Structured Comparison of Metrics to Evaluate the Robustness of Image Classification Models

- This project focuses on metrics for image classifier robustness, such as adversarial and corruption robustness, Lipschitz continuity, and formal verification.
- It includes implementing at least two image classifiers on a chosen benchmark dataset to validate the results using Pytorch.

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

DIGITAL SKILLS

Software skills

Git | Pytorch | TensorFlow for Deep learning | Python | MATLAB | VBA | C++ | 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)

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

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 CO_2-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.

LANGUAGE SKILLS

English

Business fluent (C1)

German

Basic user (A2)