MEHAL AGARWAL

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EDUCATION

Carnegie Mellon University — **Pittsburgh, PA**
- Master of Science (Electrical and Computer Engineering in AI/ML Systems) — Present

Nanyang Technological University — **Singapore**
- Bachelor of Engineering (Electrical and Electronic Engineering**)** — *Jul 2018 – Dec 2021*
- Honours (Highest Distinction) CGPA **4.85 /5.00**
- 3*Dean's Lists (2021 – 2022, 2020- 2021, 2019 - 2020) (top 5%)
- Accelerated Bachelors Program (3.5 years)
- Specialization: Computer Engineering and Data Intelligence & Processing

WORK EXPERIENCE

Cambridge Center for Advanced Research and Education in Singapore — **Singapore**
Software Developer — *Feb 2022 – Jul 2023*
- Designed and developed software tools to support digital twin development in cross-domain city-related applications in the WorldAvatar, a knowledge-graph based digital twin ecosystem.
- Developed an **object-graph mapping library** using **Java** for the WorldAvatar to provide a high-level, abstract, and object-oriented programming interface for highly automated manipulation of knowledge graph data, displacing the previous development paradigm of manual query composition for every application, thereby reducing manual processing time by **92%**.
- Developed a relational database access agent to handle HTTP requests to perform **PostgreSQL** query operations automatically, improving the service access time by **48%**.
- Developed a **Knowledge Graph Question Answering (KGQA)** System for Chemistry, Marie and BERT.

Enuit Pte. Ltd. — **Singapore**
Technology Analyst Intern — *Jun 2021 – Aug 2021*
- Completed an **automated test project** with a comprehensive set of automated test cases that ensured both projected and finalized broker commissions are calculated accurately for each financial instrument during its life cycle, improving the process by **54%**.

Seagate Singapore International Headquarters — **Singapore**
Machine Learning Intern — *Feb 2021 – Jun 2021*
- Collaborated with the Engineering Team to collect data from testers and used **Python** programming to analyze the tester KPIV parameters. Built a dashboard to display the results of the analysis.
- Developed a methodology using Machine Learning models, such as **LSTM** and **XGBoost** to detect aberrant values and temporal shifts in time-series plots, thereby reducing manual investigation by **67%** and improving quality assurance protocols by **35%**.

Rolls Royce@NTU Corporate Lab — **Singapore**
Software Intern — *May 2020 – Aug 2020*
- Designed and developed a Graphical User Interface (GUI) and a data visualization platform for a microgrid sizing tool and aerospace power systems application using **MATLAB** App Design and Programming.

PUBLICATIONS

- Chadzynski, Arkadiusz, et al. "Semantic 3D City Interfaces–intelligent interactions on Dynamic Geospatial Knowledge Graphs." c4e-Preprint Series 297 (2022).
- Zhou, X, et al. "Marie and BERT - A Knowledge Graph Embedding based Question Answering System for Chemistry." c4e-Preprint Series, 307 (2023).

ACADEMIC PROJECTS / RESEARCH EXPERIENCE

Key Frame Extraction from a Big Dataset (collaboration with Continental Automotive, Singapore) — *Jan 2021 – Dec 2021*
- Developed an automatic keyframe filter package to extract useful sensor data for annotation required in autonomous driving; achieved by performing temporal 2-D multi-label tagging of images using state-of-the-art Faster R-CNN.
- Extended the model by adding a novel visibility detection feature for each object identified in the image.

A Data-Driven Land-Use Configuration to Improve Community Resilience — *Aug 2020 – Nov 2020*
- Applied supervised machine learning models and solved candidate site selection as a ranking problem.
- Implemented Linear Regression with Regularization, and Random Forest to predict key variables related to land usage.
- Implemented Learning to Rank: LambdaMart to evaluate the plots based on users' rating data gathered from Google Maps.

Web Application Design and Development — *Aug 2020 – Nov 2020*
- Utilized HTML, CSS, JavaScript, PHP, and SQL to develop a commercial web application for online purchase of electronics.

Artificial Intelligence and Data Mining: Image Classification — *Oct 2021 – Nov 2021*
- Designed algorithms and used TensorFlow to perform Image classification on CIFAR-10 dataset.
- Utilized the Sequential API of Keras to construct a CNN model from scratch and applied transfer learning to construct a model with VGG-16 pretrained feature extraction backbone.

AWARDS / ACHIEVEMENTS

- **Lam Research Scholarship Award** — *Aug 2020*
- **Gold Medal** from SBGS, Kolkata for ***Outstanding Academic Performance (Rank 1)*** in AISSCE (Standard 12) — *Aug 2018*
- **Merit Certificate** in Chemistry (99/100) and Mathematics (100/100); TOP 0.1% — *Aug 2018*

SKILLS

- **Software Programming**: C++, C, Java, Python, JavaScript, HTML, CSS, PHP, Maven, MATLAB, MySQL, SPARQL, PostgreSQL
- **ML Frameworks:** TensorFlow, Keras, PyTorch, Pandas, Scikit-Learn
- **Other Tools:** Docker, Git, Linux, Latex, OpenCV, Azure