Adnan Azmat

Computer Science and Engineering
Nanyang Technological University, Singapore

Email : adnan002@e.ntu.edu.sg
Phone : +65-85463501

Academic Details

- **Nanyang Technological University, Singapore** *(Aug 2023 - Apr 2024 Expected)*
  MSc Artificial Intelligence — CGPA: 4.25 / 5
  Relevant Courses: AI Ethics, Mathematics for Artificial Intelligence, Machine Learning Methodologies, Deep Learning, Advanced Computer Vision, Natural Language Processing, Multi-Agent Systems, Time Series Analysis, Thesis (Speaker Diarization)

- **Birla Institute of Technology, Mesra** *(2017 - 2021)*
  BE Information Technology — Grade: First class with distinction
  Relevant Courses: Engineering Mathematics, Data Structures, Discrete Mathematics and Graph Theory, Database Management, Operating System, Theory of Computations, Scientific Computing, Software Engineering, Soft Computing, Design of Algorithms, Computer Network and Security, Information and Coding Theory, Optimization Techniques, Data Mining, Artificial Intelligence, Parallel and Distributed Computing, Compiler Design, Computer Graphics

Experience

- **Research Engineer: Speech and Language Lab — NTU Singapore** *(Aug 2023 - Present)*
  - Under the guidance of Prof. Chng Eng Siong, my research subject is speaker diarization, specifically focusing on enhancing Target-Speaker Voice Activity Detection (TS-VAD) model.
  - Implemented a robust data pipeline for training the transformers based TS-VAD model on large wideband simulated data. Extended the model to handle arbitrary number of speakers, enhancing its versatility. Demonstrated the effectiveness of the TS-VAD model in achieving impressive results in the DIHARD3 challenge.
  - Proposed and integrated speaker counting, speech enhancement and speech separation techniques to solve far-field speaker diarization in noisy-condition.
- **Software Engineer: Special Clouds — Microsoft, Noida, India** *(July, 2021 - Aug, 2023)*
  - Special Clouds team abstracts the challenges of configuration management to enable the deployment of Microsoft services to sovereign and air-gapped clouds. My responsibilities included designing, implementing and testing the config management solutions for M365 services deployed via containers on Azure Kubernetes Service.
  - Implemented the pipeline for moving region-specific service configs from their repositories to a config store. These configs are fetched and stored in the K8 config map of the cluster during deployment. Configured monitoring and alerting scenarios for the config management flow using Prometheus and Grafana.
  - This solution has simplified config file handling, allowed runtime config updates without redeployments and abstracted cloud-sensitive configs hence saving deployment time as well as increasing security.
- **Software Engineer Intern: Outlook Calendaring — Microsoft, Bengaluru, India** *(Jan, 2021 - June, 2021)*
  - Re-engineered Outlook events and calendar APIs, shifting from a monolith to a micro-services architecture using gRPC
  - Designed and developed a traffic splitter tool to redirect traffic to the modernized APIs while also collecting metrics and telemetry for analysis
  - Traffic splitter enabled safe and staged roll-out and testing of modernized APIs worldwide while handling an average of 15 billion hits a month
- **Software Engineer Intern: Evee Bot for MS Teams — Microsoft, Bengaluru, India** *(May, 2020 - July, 2020)*
  - Evee intelligently manages calendar events and schedules work meetings inside Microsft Teams. My contributions empowered Evee to intelligently propose a meeting subject line whenever a real-time conversation indicates an intent to set up a meeting.
  - Trained, tested and fine-tuned Azure Language Understanding (LUIS) and keyword extraction models using the Enron Corpus. Proposed a bi-directional LSTM model for custom data.
  - Seamlessly incorporated the model with an exceptional BLEU score of 0.89 into the bot using Azure Bot Service.

Projects

- **Investigating Fouling Efficiency in Football Using Expected Booking (xB) Model** *(Paper ↗ — Code ↗)*
  - Proposed a novel metric "Expected Booking" (xB) to estimate the likelihood of a foul resulting in a card. The xB model can also be used to estimate fouling efficiency by comparing the expected bookings to the actual bookings received.
  - Model was trained and tested using StatsBomb event and 360 data for spatial context, employing ensemble methods to improve the model performance. The xB model incorporated ball possession value (VAEP) as a feature to quantify the threat posed by the team in possession.
  - Demonstrated the effectiveness of the xB model by using it to analyse the FIFA World Cup 2022 data. The model quantifies fouling efficiency of teams and players, identfiying the fouling efficiency and tactics of teams and players.

- **Semantic-Guided Generative Image Augmentation with Diffusion Models: Implementation** (*Report ↗*)
  - Implemented and evaluated the Semantic-Guided Generative Image Augmentation Method with Diffusion Models (SGID) method to generate diverse and semantically consistent augmented images for image classification, using image labels, captions, and diffusion models, as proposed by Li et al. 2023.
  - Compared the proposed method with baseline augmentation techniques such as CutMix and RandAugment on various datasets and backbone architectures, and analyzed the results and challenges. SGID is capable of generating augmented images with more variability and semantic relevance, which helps the model generalize better to unseen data.
  - Replicated the original paper's implementation details and experimented with different parameters and strategies to improve the quality and consistency of the generated images.
- **PassValue: Valuing Passes using Football Tracking Data** (*Code ↗*)
  - Utilized tracking data to identify techniques for valuing passes, resulting in more comprehensive analysis than traditional events data as tracking data captures much more insights as it includes every player position at each instant.
  - Implemented a metric using tracking and event data to measure pass worth through calculations of pass distance, opponents positioning and press, pitch control, Valuing Actions by Estimating Probabilities (VAEP), Expected Possession Value (EPV) and pass errors. This metric can be used for ranking, scouting, and identifying teams and players with identical style.
- **Conserve-a-BIT: Crowdfunding platform on Ethereum** (*Code ↗*)
  - Developed a decentralized crowdfunding platform on Blockchain that enables non-profits, government organizations, and startups to raise donations in a transparent and secure manner.
  - Designed and implemented an innovative smart contract for the platform that ensures transparency, safety, and eliminates third-party charges. The smart contract also empowers contributors with the authority to release funds, track fraudulent scammers, and reinvest their donations.
  - Utilized a diverse tech stack including Solidity for smart contract development, Node.js and React for backend and frontend development respectively, MongoDB for database management, and Web3.js for Ethereum JavaScript API.
- **PlayFair: Online Trivia Games Helper**
  - Developed a Python script that uses Optical Character Recognition (OCR) to read questions and options from online trivia games in real-time, automates web searches.
  - The script performs text analysis on search results to suggest the best answer in seconds, providing real-time assistance by suggesting the most likely correct answers.
- **Submissions: NTU MSc Artificial Intelligence** (In Progress) (*Reports ↗*)
  - Machine Learning Assignment, Reinforcement Learning Assignment, Deep Learning Assignment, Responsible AI Project

Academic & Professional Achievements

- Runners Up, Codefundo++ Hackathon: Microsoft's Hackathon for college students
- Top 5, Jharkhand StartUp Hackathon: National Hackathon for budding startups
- 3rd Place, Innovision: Run IO Hackathon at NIT Rourkela
- Scholarship, Tata Steel Millennium Scholarship (Category A)
- 7th Place, Forbes D2C Competitive Leaders 2021: Excellence in academic and corporate ecosystem
- GRE — 319 (168 Quant, 152 Verbal) and IELTS — 7.5
- 99 %ile, JEE Advanced (2017): India's Engineering Entrance Exam with 1.2 million candidates
- 321 Rank, WBJEE (2017): Engineering Entrance Exam with 120K candidates
- 97% in ICSE (2015) and 94% in ISC (2017) conducted by CISCE

Technical Skills

- **Languages:** JAVA, Python, C#, Shell, C, Go, LaTeX, JavaScript, SQL
- **Tools/Technologies**: Git, PyTorch, TensorFlow, Docker, Kubernetes, Azure, Microservices, RESTful APIs, Node.js
- **Machine Learning**: Regression, Classification, Kernel Methods, Bayesian, Decision Trees, Ensemble Methods, Clustering
- **Deep Learning**: Speech Processing, Computer Vision, Natural Language Processing, Transformers

Extra Curricular Activities

- National Champions, TCS IT Wiz: India's largest Tech Quiz with over 20000 participants
- National Champions, Inquisitive: The Ultimate Business Quiz 2020 by IMT Hyderabad
- Senior Executive, ACM Student's Chapter — BIT Mesra
- Senior Executive, IEEE Student Branch — BIT Mesra
- Quizzing Head, UNESQUO (United Engineers Speaking and Quizzing Organization)
- Runners Up, Futsal: Street Football — BIT Mesra
- Winners, 5th CSIR-NML Science Quiz: Jharkhand's most prestigious science quiz
- National Semi-Finalist, Bournvita Quiz Contest: India's most popular TV quiz show