Werner J. Mostert

Masters in Engineering

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Profile

I'm genuinely passionate about diving into technology and engineering, always tinkering and exploring how things work. After completing my degree in Computer Engineering, I've taken my curiosity further into the realms of Artificial Intelligence and Machine Learning, focusing my Master's thesis on these ever-growing fields. My approach to challenges is grounded in logical thinking, and I naturally step into leadership roles, always aiming to communicate clearly and effectively with those around me.

I believe in the continuous pursuit of knowledge, especially in the fast-paced world of technology and engineering. Living by my motto, "Find a balance in everything that you do!", has not only helped me navigate the complexities of my field but also reminded me to keep a grounded perspective in both my professional endeavors and personal growth. I'm excited about the opportunity to bring my skills, curiosity, and balanced approach to a team that values forward-thinking and collaborative problem-solving.

Education

M-ENG Electronic
Tshwane University of Technology
01/2023 - ongoing (expected finish 04/2024)

B-ENG Computer
University of Pretoria
01/2018 - 11/2022

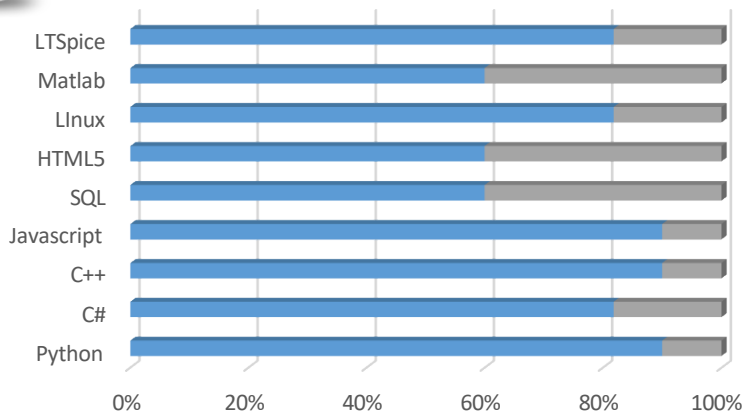
Grade 12
Pretoria North High school
12/2017

Volunteering

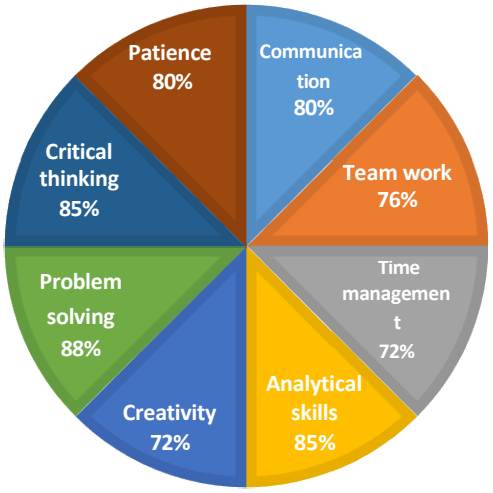
Wollies Animal Shelter 06/2019
Pretoria North

- Helped building shelters for the animals.
- Helped feeding the animals.

Technical Skills



Strengths



Achievements

Grade 11 — 12/2016
High school Pretoria North
Best IT student

Hobbies


Chess


Electronics


Music


Sport


Outdoors

Past Projects

Final Year Project: Facial Recognition with Face Masks on Embedded Platform

Project Overview

Amidst the global COVID-19 pandemic, the necessity for effective facial recognition technology that accommodates face masks became paramount. My final year project at the University of Pretoria (TUKS) aimed to address this challenge by developing a facial recognition system capable of accurately identifying individuals wearing face masks in real-time. This system was implemented on an Odroid N2+ platform using C++ programming language, chosen for its efficiency and control over system resources.

Technical Details

The project leveraged advanced real-time processing techniques and multiprocessing to manage and analyze high-volume video data streams efficiently. The system utilized a first principle design of computer vision algorithms to detect facial features obscured by masks, integrating various artificial intelligence methods to enhance recognition accuracy. This included the adaptation of convolutional neural networks (CNNs) and machine learning models specifically tuned for partial facial recognition.

Achievements and Learning Outcomes

Throughout the project, I deepened my understanding of computer vision principles and gained significant experience in deploying AI models on embedded systems. The project not only honed my skills in C++ and embedded platform development but also provided me with valuable insights into real-time system design, optimizing computational resources, and ensuring system reliability under continuous operation. The successful implementation of this project underscored the potential of integrating AI with embedded technologies to solve pressing real-world problems.

Master's Project: Multimodal Emotion Recognition Using AI Techniques

Project Overview

For my master's thesis, I delved into the exploration of artificial intelligence techniques for emotion recognition, employing multiple data modalities. The project's ambition was to create a system that could accurately identify and classify human emotions by analyzing varied sources of input data, including audio, visual, and physiological signals. The cornerstone of this system was a late fusion model, which intelligently combined the outputs of distinct AI models, each processing a different modality of data, to arrive at a comprehensive understanding of the subject's emotional state. This system was designed and implemented using the python language combined with TensorFlow and OpenCV.

System Architecture and Implementation

The multimodal emotion recognition system was meticulously designed to ensure seamless integration and synchronization of data from diverse sources. Each modality was processed using specialized AI algorithms best suited for the specific type of data, ranging from deep learning models for visual and audio analysis to time-series analysis techniques for physiological data. The late fusion approach was strategically chosen for its ability to leverage the strengths of each individual model, enhancing the overall accuracy and robustness of the emotion classification.

Data collection for system

One of the primary challenges encountered during this project was the need to collect a dataset for the training of AI models. A critical aspect of this task was ensuring participant comfort and preserving the authenticity of the emotional responses obtained. To tackle this, we needed to controlled the environment to minimize any external stressors, providing participants with sufficient time to adapt before data collection commenced.

Another significant challenge lay in the technical requirements of synchronizing multimodal data streams. To address this, we implemented a centralized data collection framework equipped with timestamping capabilities for all inputs. This approach ensured the precise synchronization of data streams in post-collection processing, allowing for an integrated analysis of the diverse modalities involved.

Achievements and Learning Outcomes

This project significantly expanded my expertise in AI and machine learning, particularly in the context of multimodal data processing and analysis. It provided a practical framework for applying late fusion models in AI, demonstrating their effectiveness in complex classification tasks. Furthermore, the project underscored the importance of a holistic approach to AI model development, emphasizing the synergy between different AI techniques and the critical role of data integration in achieving high-performance AI systems. As I approach the documentation stage, I am compiling the insights, methodologies, and results of this comprehensive study, contributing to the field's body of knowledge and paving the way for future innovations in emotion recognition technology.