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UJ CSC3A Mini Project Proposal 2025
1 message

Google Forms <forms-receipts-noreply@google.com>   28 March 2025 at 09:44
To: georgeapril202020@gmail.com

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Thanks for filling in UJ CSC3A Mini Project Proposal 2025

Here's what was received.

Edit response

UJ CSC3A Mini Project Proposal 2025

This mini-project aims to develop a system that utilises graph-based techniques to analyse images, focusing on similarity detection, classification, or path finding.

Email *

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Person 1: Initials and Surname *

DPM Makweng

Person 1: Student Number *

221037763

Person 2: Initials and Surname *

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Person 4: Student Number

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Primary: You will be doing graph-based techniques to analyse images, focusing on:
*

⦿ Similarity Detection

◯ Classification

◯ Pathfinding

Secondary: You will be doing graph-based techniques to analyse images, focusing on:

*

○ Similarity Detection

◉ Classification

○ Pathfinding

Describe your task or problem: *

Millions of people are forced to rely on unsafe water sources such as streams, rivers and unprotected wells. According to South African Human Rights Commission over 50% of rural households lack access to a reliable water supply. Water quality needs to be assessed and the Current methods are problematic: Inconsistent observations due to manual examination, Slow processing times for test results and Limited ability to examine polluted spread.

Describe how you will solve the problem (high-level): *

A Java-based desktop application for automated water quality detection.
Features include:
- Implementing a classification algorithm to classify water samples in categories (e.g. undrinkable, contaminate, dirty)
- Using similarity detection technique to differentiate water samples and pick out trends in water contamination

What algorithms will you use (technical)? *

Graph construction using nodes and edges to represent important features.
Similarity detection using a reference dataset for classification.
Graph Edit Distance (GED) to measure how many node/edge additions/deletions are needed to match two graphs.
k-Nearest Neighbours (k-NN) Graph Matching
Minimum Spanning Tree (MST) Comparison to calculate the MST for each image using Prim's/Kruskal's algorithm.

Project justification: Why is it a good idea to use a Graph to solve your problem? *

The project introduces a new method for water quality detection using graph-based techniques. it is a good idea to use graphs because it allows for better classification of water samples, and also addresses challenges in traditional testing methods by being faster and more accurate similarity detection.

What will Person 1 do? *

Setting up environment tools and GUI and image processing and feature extraction.

What will Person 2 do? *

Graph construction and Image processing and feature extraction.

What will Person 3 do? *

Setting up environment tools and GUI and image processing and feature extraction.

What will Person 4 do?

Research and planning, image processing and feature extraction and implementing graph algorithms.

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