# University of Science and Technology of Ha Noi
### Department of Information and Communication Technology



# Group Project Report

## USTH Connect
### Integrated app for university life assistant and student networking

by

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|---|---|
| Nguyen Thi Van | 22BI13459 |
| Chu Hoang Viet | 22BI13462 |
| Nguyen Hoai Anh | 22BI13021 |
| Nguyen Dang Nguyen | 22BI13340 |
| Do Minh Quang | 22BI13379 |

# Contents

**Abstract**

# 1 Introduction

## 1.1 Context and Motivation

- We can ask GPT for this part

## 1.2 Objectives

The main goals for this project is to build a mobile application that can help to control our university systems, including students' grades, study schedule, and especially make an additional feature to connect students who share the same interest of subjects, hobbies so that they can communicate and study together after classes.

## 1.3 Related works

In this part we will cite some related works/papers that we used mainly for this project. We also summarize the content of these resources.

# 2 Background

### 2.0.1 Mobile Application Background

In this part we will introduce about the standard mobile application framework.

### 2.0.2 Machine Learning Background

In this part we will explain the theory and mathematical bases for the clustering algorithm that we used in this project.

- Machine Learning Workflow: describe a standard workflow for a clustering algorithm.

- Data encoding method: One Hot Encoding, Word Embedding TD-IDF

- Dimensionality reduction

- Clustering algorithm: K-mode (? can we use more algorithm for this part)

- Evaluation Metrics: Silhouette score, Davies-Bouldin index

# 3 Material and Methodology

## 3.1 Material

### 3.1.1 Data Sources

In this part we will explain about the process of gathering data from scratch, by doing survey.

### 3.1.2 Experimental Setup

Still consider what to write for this part. Maybe unecessary.

## 3.2 Methodology

This part should describe details the implementation process of both mobile development app and machine learning

Structure: Data describe $\rightarrow$ Mobile app framework $\leftarrow$ Machine Learning Workflow (integrated inside app) $\rightarrow$ Demo for each feature.

### 3.2.1 Mobile App Framework

### 3.2.2 Machine Learning Workflow

In this part, we will describe more detail about:

#### 3.2.2.1 Data Preprocessing

- describe the data structure

- how and why we using encoding method

- how we split data for training and testing

#### 3.2.2.2 Model Configuration and Training

In this part we will descrbie detailed about

- Model configuration: describe models that we used and why we choose it.

- Model training: process of training the model

#### 3.2.2.3 Model Evaluation

In this part, we will describe:

- Attribute we choose to evaluate model performance

- Evaluation metrics: Silhouette score, Davies-Bouldin index

# 4 Results and Discussion

## 4.1 Results

### 4.1.1 Mobile App Results

In this part we can have the demo for each feature of the app.

### 4.1.2 Machine Learning Results

In this part we will show the result of the clustering algorithm, using the evaluation metrics that we mentioned in the previous section.

## 4.2 Discussion

# 5 Conclusion & Future Work

## 5.1 Conclusion

## 5.2 Future Work