**Graduation Project - English Abstract**

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| **Project Code:** | AI12 |
| **Project Title (in English):** | ROVER ALTAIF |
| **Project Title (in Arabic):** | المستكشف الطايف |
| **Scientific Department:** | ARTIFICIAL INTELLIGENCE |
| **Supervisor(s):** | DR.MAHMOUD ABD ALAAL |
| **Project Team:** | 1-Farah Mohamed Kamel2-Mohamed Khaled3-Dina Mohamed ALSayed4-Mohamed Said5- Mohamed Hassan6-Razan Bassel Sayed |

**Project Abstract**

Rovers are widely regarded as highly capable devices that mimic human beings and are capable of exploring various environments under challenging circumstances. In our project, we have conceived a compact and agile Rover designed to navigate and perform tasks in demanding situations. The Rover comprises a car kit equipped with motors and wheels, which are controlled by an Arduino Uno for precise movement. Additionally, we have incorporated a Raspberry Pi to aid the Rover in object detection tasks.

Our Rover boasts a camera integrated with an object detection model, enabling it to provide real-time information about its surroundings. To further enhance its capabilities, we have included a DHT11 sensor that measures humidity and temperature. Upon completion of its mission, the Rover generates a detailed map illustrating its traversed paths. Furthermore, it provides a comprehensive dashboard presenting an analysis of the data collected during the mission.

All the aforementioned outputs are continuously monitored and observed through a Flutter application seamlessly connected to Firebase. Firebase serves as the intermediary between the application and the Raspberry Pi. Within the Flutter application, users can initiate and terminate Rover missions using dedicated start and end buttons. The application offers a range of features, including authentication, live video streaming with object detection, real-time temperature and humidity readings, access to mission maps, and an archive of previous maps. Additionally, users can explore the analysis dashboard to gain insights from the collected data.

By combining cutting-edge technology and a user-friendly interface, our project delivers a sophisticated Rover system that empowers users to conduct efficient and effective missions in diverse environments.