**PROJECT PROPOSAL**

**ACADEMIC CITY UNIVERSITY**

**GROUP MEMBERS:**

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**PROJECT TITLE:**

***Gesture-Based Task Automation System***

**DATE:**

JUNE 30,2025.

### **INTRODUCTION**

Human-computer interactions have improved, but most systems still utilize the usual input devices like mice and keyboards. This makes operation by individuals with disabilities or individuals in environments where touch-based interaction is inconvenient or unsafe, very difficult.

This project introduces a gesture-based system that triggers various activities in Microsoft Power Automate. With the help of computer vision and machine learning, individuals can assign workflows they wish to execute based on their preferred hand-gestures. The system will also use a standard webcam to have visibility of the users’ gestures, MediaPipe for recognizing the various gestures, and a CNN model which will be converted to an API call for the automation.

### **PROBLEM STATEMENT**

Most automation systems, except for a few, employ manual control. This limits its use by individuals with motor disabilities and also individuals in environments where a touchless interaction is essential in order to achieve important tasks example being a nurse or a doctor needing to check patient details during procedures, without having to contaminate their hands by using traditional control methods.

The majority of gesture recognition software does not cooperate with automation programs like Microsoft Power Automate, and therefore there is a bridge between gesture input and automation. Current solutions are not very accurate, do not allow for a lot of gestures, and are influenced by environmental factors such as lighting and environmental noise.

### **CLEAR AIM**

### This project will create a system that recognizes hand gestures without touching. It will work with Microsoft Power Automate flows using MediaPipe and CNNs. This will help with notifications, smart device control, and interacting with apps without the need for a contact trigger.

### **TARGET OBJECTIVES**

* To construct a gesture recognition system with MediaPipe and machine learning.
* To identify stationary hand gestures appropriately.
* To connect the gesture recognition system with Microsoft Power Automate through APIs.
* To determine usability and accuracy of the system.
* To analyze gesture automation's uses and scalability.

### **TIMELINE**

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| **S/N** | **TASKS** | **DURATION** |
| **1** | Selecting a Topic | **1 day** |
| **2** | Selecting a Supervisor | **1 day** |
| **3** | Supervisor’s approval of selected topic | **2 days** |
| **4** | Research project feasibility based on existing technology | **10 days** |
| **5** | Project proposal Submission | **2 days** |
| **6** | Approval of Proposal | **2 days** |
| **7** | Requirements Gathering | **7 days** |
| **8** | Requirements Analysis | **4 days** |
| **9** | Documentation of Requirements | **5 days** |
| **10** | Poster Presentation | **1 day** |
| **11** | System Design | **20 days** |
| **12** | UI/UX Design | **10 days** |
| **13** | Implementation and Unit Testing | **20 days** |
| **14** | Integration and System Testing | **10 days** |
| **15** | Alpha and Beta Testing | **7 days** |
| **16** | Final Project Presentation | **2 days** |

### **COMPONENTS TO BE USED**

* Webcam.
* Processing Unit (Laptop or Desktop PC).
* Microcontroller (optional for IoT integration).
* CNN Model (for gesture classification).
* APIs (for Power Automate integration).

### **TOOLS**

* **MediaPipe** – For hand landmark detection.
* **TensorFlow/Keras** – For building and training the CNN model.
* **OpenCV** – For image processing.
* **Flask** – For serving the model and triggering APIs.
* **Microsoft Power Automate** – For workflow automation.
* **Visual Studio Code** – For coding environment.

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### **REFERENCES**

1. Mishra, A., Patel, V., & Rathi, R. (2023). MediaPipe for Real-Time Gesture Recognition. *International Journal of Computer Vision and Automation*, 45(2), 134–148.
2. Kakkoth, R., & Gharge, S. (2018). Gesture Controlled Automation System Using Computer Vision. *International Journal of Advanced Research in Computer Science*, 9(5), 56–60.
3. Muneeb, M. et al. (2023). Smart Home Automation Using Gesture-Based Control. *International Conference on Assistive Technologies*, 112–118.