**MM 226 Supervised Learning project consent form**

**PART I \_ Submission**

**Name of project supervisor(s)**: Prof. Prasanna Kumar S. Mural

**Title of project:** AI-driven Smart Gloves for Motion Detection

**Project participant details: (Max 5 participants)**

| **Roll Number** | **Name of Student** | **Role of participant in project** |
| --- | --- | --- |
| 21D110016 | M. Hassan Shaikh | Project Lead & AI Researcher |
| 21D110012 | Om Kulpe | Prototype Engineer & Software Developer |
| 21D110007 | Keloth Uday Krishna | Documenter & Prototype Engineer |
| 210110054 | Jai priyadarshi | AI Researcher & Experimentation |
| 210110038 | Dev Kumar acharya | Experimentation & Software Developer |

**Objectives of the project: the deliverables of the project must be clearly outlined.**

Objectives

Develop smart gloves equipped with piezoelectric and triboelectric sensors to detect hand motion & gestures for sign language recognition

1. Designing & 3D printing Polyvinylidene fluoride polymer based triboelectric highly shape adaptive sensor for sensitive joint motion monitoring & tactile sensing, demonstrating it’s application in real-time human-machine interaction

2. Utilizing an Arduino micro-controller to develop a custom sketch program file that interface with a piezoelectric/triboelectric 3D printed sensor, enabling precise real-time signal recording, advanced processing and data logging for motion detection

3. Pre-Processing the signal using advanced Signal Processing techniques, apply moving window mechanism to construct input matrix and implement LSTM/Transformer/RNNs/ other hybrid models to achieve a proposed accuracy.

**Role of each member:**

We have decided the roles on basis of what individual wants to learn and hence allotted multiple roles(so it follows as primary & secondary roles).

Responsibility of each roles are as follows:

**Project Lead**

* Communicating with the project supervisor and TA regarding the status of the project
* Arranging lab visits for experimentation and resolving queries
* Arranging materials required for the project and budget management

**Documenter**

* Documenting the contents discussed in meetings for future reference
* Creating reports and presentations involved in the project

**Prototype Engineer**

* Assembling all components to build prototypes of the gloves
* Overlooking integration of the software and hardware involved

**Experimentation**

* Mechanical testing and structural analysis of materials used
* Electrical testing of microcontroller (Arduino)
* Establishing connection between the software and the electrical components

**AI Researcher**

* Researching about efficient techniques for motion detection
* Building and testing different AI models

**Software Developer**

* Building a program to detect and analyse signals coming from the glove
* Applying AI models to classify hand gestures

**Timeline of the project (in the format given below)**

| Month | Week | Assigned task |
| --- | --- | --- |
| August | I | 1. Brainstorming ideas 2. Setting objectives 3. Finalising project details |
| II |
| III | 1. Processing polymer to generate filament 2. 3D printing components 3. Mechanical testing and structural analysis |
| IV |
| September | I | Integration of all physical components of the smart glove |
| II |
| III | **MIDSEM** |
| IV |
| October | I | 1. Software development and AI model building 2. Connecting software to hardware 3. Testing and modifying |
| II |
| III |
| IV |
| November | I | Ideating and planning the usage of this technology in other domains |
| II |
| III | **ENDSEM** |
| IV |