|  |  |
| --- | --- |
|  | **Vasavi College Of Engineering (Autonomous)**  Department of Electronics and Communication Engineering |
| **Academic Year:**  2022-2023 | **Project Guide**: N. Abid Ali Khan (Asst Professor)  **Title:** Embedded C++ Predictive Text Classifier for User Interface Design to STM32F4 MCU.  **Students**: M. Amarnath (1602-19-735-067)  Mihir Deshpande (1602-19-735-087)  Ch. Rishitha (1602-19-735-098) |

**Abstract:**

**AI Predictive text parsers enable users to interact with the systems with much more ease and comfort. The proposed project is an attempt that allows the student to apply the concept of object-oriented programming being learnt in desktop computer systems to microcontroller. SMT32Fxx is selected as the target microcontroller and a standard LCD and keypad were interfaced to it using the GPIOs to provide menu-based user interface. The first phase of the project consists of implementing C++ classes to authenticate the system and compare the performance with that of implemented C code. The next phase deals with single-layer neuron being planned to implement using a standard doubly linked-list and work on completing the predictive texting. The analysis of the performance and complexity (time & space) is an integrated work of this module. The efficient RAM memory management and observations needs to be inferred as a part of the completion of the project.**

**Keywords: Embedded C++, Artificial Intelligence, microcontroller, ARM, OOPs.**

**References:**

1. B. Tianyu, "A control method to prevent falling from a treadmill based on STM32 microcontroller and ultrasonic transducer," 2017 29th Chinese Control And Decision Conference (CCDC), 2017, pp. 5025-5028, doi: 10.1109/CCDC.2017.7979386.
2. W. Liu and J. Dai, "Design of Attitude Sensor Acquisition System Based on STM32," 2015 Fifth International Conference on Instrumentation and Measurement, Computer, Communication and Control (IMCCC), 2015, pp. 1850-1853, doi: 10.1109/IMCCC.2015.393.
3. M. Meier, P. Streli, A. Fender and C. Holz, "Demonstrating the Use of Rapid Touch Interaction in Virtual Reality for Prolonged Interaction in Productivity Scenarios," 2021 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), 2021, pp. 761-762, doi: 10.1109/VRW52623.2021.00263.

**Tools Required:** Keil uvision5 IDE, Proteus 8.12, STM32Cube IDE

**CO-PO-PSO Mapping:**

|  |  |  |  |
| --- | --- | --- | --- |
| **S No** | **Course Outcomes** | **PO Number Mapped** | **PSO** |
|  | Analysis of CortexM4F powered STM32F MCU Architecture & its programming model | 1, 2, 3 | 1 |
|  | Configuration of STM32 tools in host and installation for experimental setup | 2, 3, 5 | 1, 2, 3 |
|  | Modules identification with device driver implementation using embedded C. | 2, 3, 4, 5 | 1, 2, 3 |
|  | Validation of the design in Proteus IDE and teammate’s individual role identification. | 3, 4, 5 | 1, 2, 3 |
|  | Documentation of the thesis, demonstration of the hardware and presentation of the design along with the results with teamwork. | 6, 8, 9, 10, 11 | 1, 2 |

**Signature of the Guide: Signature of Students:**