**ECG Based Personal Info Lock**

**Human Computer Interfaces (HCI)**

**SC\_45**

|  |  |  |
| --- | --- | --- |
| **ID** | **Name** | **No** |
| 20201700194 | بولا مجدي محسن مرقس | 1 |
| 20201700195 | بيتر جورج حنا فام | 2 |
| 20201700592 | فيلوباتير امجد جندي محروس | 3 |

**Data Preparation**

* **dataset**

**We have obtained 4 ECG signals for 4 different healthy subjects from PTB database. The data is split into 80% for training and 20% for testing, The description of the data is:**

|  |  |
| --- | --- |
| **Number of signals** | **4** |
| **Sampling frequency** | **1000** |

**Signals Visualization**

**A graph of a graph of a graph

Description automatically generated with medium confidence**

* **Preprocessing**

**ECG data contains noise from multiple sources (e.g., Baseline wander, Power line interface).**

**We have used a simple Butterworth filter with cut-off frequencies between [1 – 40] Hz, which is the ECG spectrum, to remove the noise.**

**A graph of a graph

Description automatically generated with medium confidence**

**Fiducial Feature Extraction**

**Which represents the amplitude of the signal fiducial points: P, Q, R, S and T and the duration between them.**

**11 Points to be detected the peak of each of the three Complexes QRS, P, T and the onset and offset of each of them.**

**At first, we detect the R-peak by using Pan and Tompkins Algorithm which is:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1. Band pass filter** | **2. Differentiation** | **3. Squaring** | **4. Moving window** | **5. Thresholding** |

**Or simply find the R-peaks by detecting the local maxima on the neighborhood and setting a suitable distance between neighborhood (550 sample).**

**Here are the 11 detected fiducial points:**

**A picture containing line

Description automatically generated**

**A graph of a normalized heart rate

Description automatically generated with medium confidenceA group of blue lines

Description automatically generated**

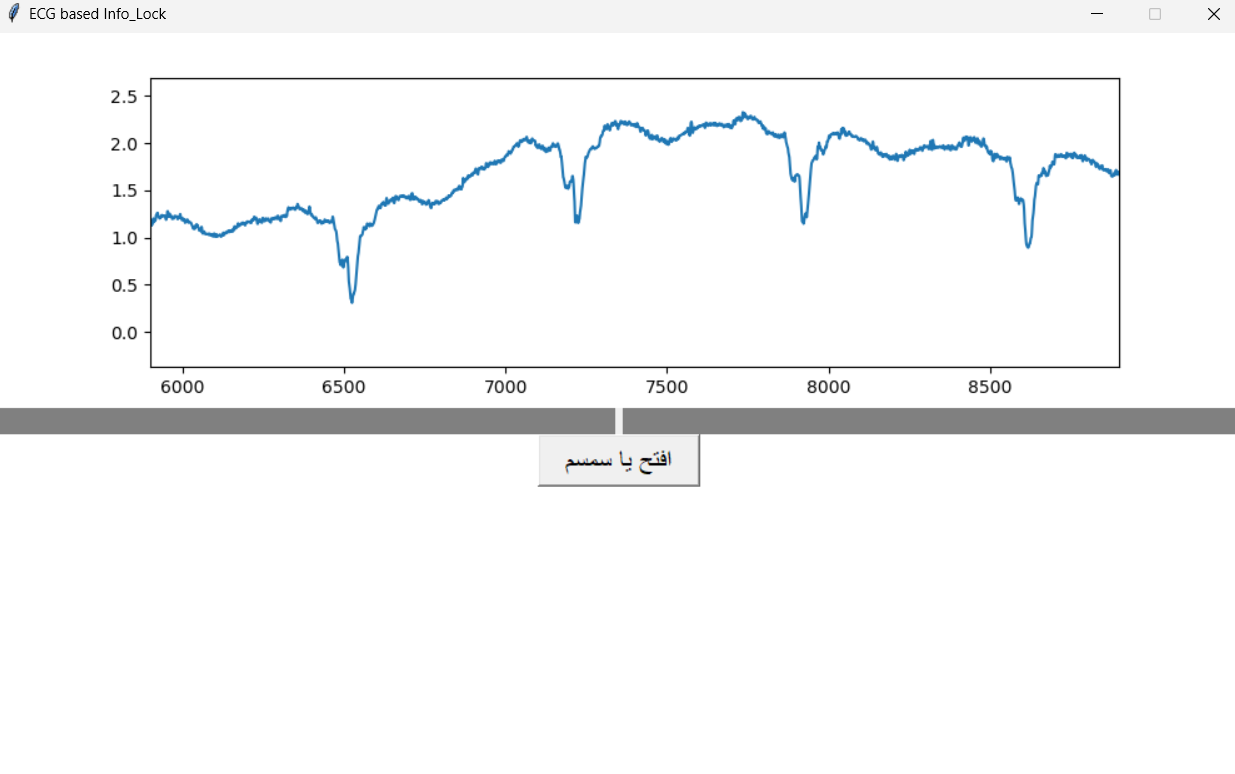
**Classification**

**We have tried multiple classifiers:**

**A black screen with white text

Description automatically generated**

**GUI**

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