## User Requirement in Software perspective (Team 5)

This document is written by analyzing Project Information by Dan Plakosh

* Empty - Functional, NF - Non Functional, I - Implementation, D - Delivery, S - Security

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| **ID** | **Req** | **Cat.** |
| Title | Project Overview |  |
| Req1 | The system you must secure and features to is an embedded face recognition system running on a Jetson Nano processor that utilizes CUDA and a windows C++ or Java control and display application. | NF/I |
| Req2 | ● Control/Display application can be written in C++ or Java (your  choice) | NF/I |
| Req3 | ● Apply concepts taught in the classroom | NF/I |
| Req4 | ● Ensure application architecture is secure | NF/S |
| Req5 | ● Ensure code is written and implemented in a secure manner | NF/S |
| Req6 | ● Ensure application network communication is secure | NF/S |
| Req7 | ● Practice finding security flaws in code / applications both  statically and dynamically | NF/S |
| Title | Project Description |  |
| Comment | picture description)    [Jetson] <-**TCP/UDP**-> (Network) <-**TCP/UDP**-> [App] -> Display  |-> Controller |  |
| Comment | ● Jetson Nano uses its camera to collect and analyze image  frames using AI to perform face detection and recognition |  |
| Comment | ● After an image frame has been analyzed the image frame along with additional amplifying information from the analysis will be transmitted to the user display and system control application |  |
| Comment | The user display and system control application is responsible for the following: |  |
| **Req8** | 1. Establishing secure and authenticated communication with the camera and image analysis application and user interface when secure mode is selected or requested. |  |
| **Req9** | 2. Provides the user interface to control the system. User Interface shall support the following modes of operation: |  |
| **Req10** | a) Secure or non secure mode of communication |  |
| **Req11** | b) Learning Mode - User images can be added to the image database. In this mode the interface should query for the name of the person in front of the camera and the number of samples to be collected. |  |
| **Req12** | c) Run Mode – System utilizes camera to identify faces and perform facial recognition. |  |
| **Req13** | d) Test Run Mode – System utilizes a video file to identify faces and perform facial recognition. |  |
| Comment | 3. Communicating with the camera and image analysis application as specified. |  |
| Comment | 4. Display image frames and any accompanying amplifying analysis information received from the camera and image analysis application in the format specified. |  |
| Title | Project Responsibilities |  |
| Req14 | 1. Implementing the specified enhancements to the applications. | NF/I |
| Req15 | 2. Ensuring that all software in both applications are architected  and coded to be secure and free of vulnerabilities. | NF/S |
| **Req16** | 3. Modifying the implementation so the applications support two  modes of communications: 1) a secure mode with all data  properly encrypted (including authentication) and 2) a plain text  mode without encryption. |  |
| **Req17** | 4. Proper fault/error detection, recovery, and reporting. |  |
| Req18 | 5. Analyzing the provided initial implementation for vulnerabilities  and developing solutions to mitigate. | NF/S |
| Req19 | 6. Analyze another team’s implementation assigned to you for  security flaws and vulnerabilities. | NF/D |
| Title | Hardware |  |
| Req20 | ● Jetson Nano with Camera, Wi-Fi hardware, fan and case | NF/I |
| Req21 | ● Micro USB Cable | NF/I |
| Req22 | ● 64 GB sd card | NF/I |
| Req23 | ● Power Supply 5v 4a | NF/I |
| Req24 | ● TP-Link AC-1750 Mesh Wi-Fi Router | NF/I |
| Title | System Software |  |
| Req25 | ● Windows OS 10 running on a laptop (Laptop) | NF/I |
| Req26 | ● Microsoft Visual Studio Community Addition (download from  Microsoft) | NF/I |
| Req27 | ● JDK (Laptop) | NF/I |
| Req28 | ● Open CV - 4.5.1-vc14\_vc15 (Laptop and Jetson Nano) | NF/I |
| Req29 | ● Putty (Laptop) | NF/I |
| Req30 | ● WinSCP(Laptop) | NF/I |
| Req31 | ● Linux OS (Jetson Nano) | NF/I |
| Req32 | ● GNU C++(Jetson Nano) | NF/I |
| Req33 | ● Dlib (Jetson Nano) | NF/I |
| Req34 | ● Jetson Utils(Jetson Nano) | NF/I |
| Title | Sample/Demo Code |  |
| Comment | ● C++ Embedded AI & CUDA based Face  Detection and Recognition Demo Software  that uses a camera and video file(Jetson) |  |
| Comment | ● C++ TCP image viewer (laptop and Jetson) |  |
| Comment | ● Java TCP image viewer (laptop and Jetson) |  |
| Comment | ● You may use your laptops to assume various  roles in your system in anyway you like |  |
| Comment | ● You may use 3rd party, open-source SW, but  please check with the owner (course  instructor). |  |
| Comment | ● Only C++ or Java (option for the control /  display application) programming language  should be used. |  |
| Title | Deliverables |  |
| Req35 | Each team will develop a presentation that covers the following topics | NF/D |
| Req36 | 1. Application Demonstration | NF/D |
| Req37 | 2. Technologies utilized. | NF/D |
| Req38 | 3. How the systems is architected and coded to ensure it is secure and free of vulnerabilities. | NF/D |
| Req39 | 4. How fault/error detection, recovery, and reporting is designed and implemented. | NF/D |
| Req40 | 5. Defects and vulnerabilities discovered in the initial implementation and the solutions to mitigate. | NF/D |
| Req41 | 6. Defects and vulnerabilities that the team uncovered when analyzing another team’s implementation. | NF/D |
| Req42 | 7. Approach to minimizing defects when developing code. | NF/D |
| Req43 | 8. Lessons learned. | NF/D |