

Natural Language to AI Face Generation Using Machine Learning Requirements and Tests Summary

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Overview

This software is designed as a way to improve and modernize criminal identification systems that are in use today. After a criminal commits crime, the moments after, used to gather information from bystanders, are the most crucial for creating an accurate representation of the human face. Even if the information is perfect, forensics sketch artists can only get so far with the composite sketches that come out of this. Our software will simplify this process by accepting natural language descriptions and even already done sketches to create a more accurate 3-D model of a suspect's face, using the camera and video surveillance infrastructure to build a database of images for the AI to utilize.

Requirements and Acceptance Tests

We have compiled a series of requirements for the application to follow, along with a set of tests that are indicative of whether the requirements have been met.

The functional requirements are what a user can expect the application to do while they use the product. The user can expect that the application will have a login screen where they must enter their credentials to gain access. After a user is logged in, the application must have a way to accept two types of input. One type would be natural language input and the other would be a sketch. Once an input method is selected, the user must be able to begin a generation of a 3-D facial model. When the model is generated, the user can also choose the option to match the model against the internal database of suspects. The user can also expect the application to have a way to submit a bug report.

The data requirements dictate that the application should accept inputs of a known and common file type. When the user chooses to input a sketch, the file should be of JPEG or PNG file formats for maximum compatibility. When the user chooses to type in natural language descriptors, the application must only accept and parse words from the English lexicon. Finally, if a user chooses to save their work for future reference or internal documentation, it is expected that the application will create a directory with an xml file to store previous configuration files and a 3-D model file that can be read and used with any mainstream 3-D modeling software.

The application performance is expected to be within reasonable speed. Front end and user login is expected to be very fast (within 5 seconds) while the 3-D model relying algorithms take a significant amount of time (5+ minutes). The system is also expected to not lose any data upon a system failure and have a very low failure rate to begin with (less than once a month)

Usability and Humanity Requirements are important in ensuring that the user has a “good time” using the product (? fighting crime). For example, requiring the use of natural language to be a main feature is key here. Additionally, the ability for the user to be able to customize various settings within the application allows the user to feel ‘at home’ while *fighting crime*. The

application is required to allow the user to be able to select their favorite wallpaper, font, or even the geographical origin of images used in the AI Face Generation. Along with these things, the application will require an intuitive set of video instructions available for the user to view at any time, along with an owner's manual. Video instructions work great for demonstrating the use of an application to give the user a more 'hands-on' set of instructions. Our application will also sport a spicy and responsive GUI. Any action that the user performs will have an effect on the GUI, whether be something lighting up, something moving, or simply a description of what's happening in the backend.

Look-and-feel are equally important aspects in a successful application as well. The final product is required to have an enticing theme and color scheme. NLAIFGML's logo will also appear on every screen of the application (see logo at end of document). The required beauty of the application will entailingly require a responsive feel and user experience.

The product will most likely be used in an office setting, and primarily distributed through an online subscription based license. The product will require internet access to run as it depends on multiple external databases to fulfill its capabilities. The product will continually be updated and the users provided continual support, and accordingly each release of the program will only build on the previous while making sure not to ruin any old work done by users prior to the update. Ethical and legal concerns will be at the forefront of the development of the product, including precautions against racial biases in the program and having a full legal team to consider the products compliance with FRT, biometrics and general privacy regulations.

Maintainability and Supportability requirements are needed for a plethora of reasons in documentation, and a few examples are listed as such: ease of fixing problems, ease of expanding the program in the future, requirements of the system needing to be developed using a certain language or CASE tools, dependency on who will maintain the system in the future, and requirements of a source code escrow. To delve further into detail, maintenance requirements could also describe ways of backing up data, updating software, troubleshooting software, connectivity to the internet and/or networks and customer support, adaptability with certain operating systems, and scalability.

Security requirements are also needed for a plethora of reasons in documentation, and a few examples are listed as such: user accounts and passwords, possible hardware security, different levels of secure authorization for specific data items or tools, and requirements for federally defined standards. To delve further into detail, security requirements could also describe account controls and levels (sysadmin vs regular account user), 2FA possibility, cloud connectivity, destroy function in the event of a compromise, a readme for the privacy policy and legal compliance, audit requirements such as receipts and proof of purchase, data encryption.