School of Computing

Year 4 Project Proposal Form

SECTION A

Project Title: PiMirror – Raspberry Pi based Smart Mirror, with Facial Recognition.

Student Name: Kieran Turgoose

Student ID: 14355046 Stream: CASE 4

Project Supervisor Name: Suzanne Little

[Note: It is the student's responsibility to ensure that the Supervisor accepts your project and this is only recognised once the Supervisor assigns herself/himself via the project dashboard. Project proposals without an assigned Supervisor will not be accepted for presentation to the Approval Panel.]

SECTION B

Proposal Description – using the following headings:

- **General area covered by the project**
  Computer Vision, IOT, Machine Learning, Android

- **Outline of the proposed project**
  - **Background - where the ideas came from**
    The idea came by researching IoT-based projects. I had an interest in pursuing an IoT-based project for my final year, and so searched for interesting things on the web. Also, while on INTRA, I saw a basic smart mirror interface being used. This allowed me to see it in action in person.

  - **Achievements - what functions it provides, who the users will be**
    This project will provide the functionality of:
    -Displaying a graphical interface on a functioning mirror, using 2-way glass.
    -Allow the user to display widgets e.g. Weather, Google Calendar,Gmail,Traffic,Notes(Memos), etc…
    -Setting profiles for users within the household. So as to customise the display/widgets/gmail.
    -Utilising facial recognition to change profiles depending on who stands in front
    (Set profiles using pictures of users face. Will have to be preset)
    -Method of changing settings/widgets/browse web/youtube/etc…
    Android App/Gesture Recognition/Alexa supported Voice Recognition.

  - **Justification - why/when/where/how it will be useful**
    It will be useful as an organiser for the busy worker. Someone who does not have much time in the morning and while in the bathroom brushing teeth/doing hair/makeup etc.. can have all their vital information provided for them.
    Perhaps a meeting they thought they had has been moved/cancelled, maybe there is bad traffic to their destination, they could have an important new email, or even just to remind them of their shopping list or to bring an umbrella with them.
    This project will provide the user who has little time to spare, all the information they will need before leaving their home in the morning.

- **Programming language(s) - List the proposed language(s) to be used**
  Python – OpenCV – for image recognition.
    - Gmail authentication.

  Android(JAVA) – application
  Potential for change or new languages if needed.

- **Programming tools / Tech stack – e.g. compiler, database, web server, etc.**
  Database to store profiles/images
  Raspberry Pi likely used as a server

- **Learning Challenges - List the main new things (technologies, languages, tools, etc) that you will have to learn**
  I have basic knowledge in python but nothing too detailed, so there will be a lot to learn in that department.
  Facial Recognition/Image Recognition.
  Smart mirror interface.
  Voice Recognition.
  Servers/Databases.
  Interaction between pi software and database

- **Hardware / software platform - State the hardware and software platform for development**
  Raspberry Pi model 3 – Raspbian OS
  Monitor
  2-way Glass
  Android Studio
  OpenCV

- **Special hardware / software requirements - Describe any special requirements.**
  N/A

Make use of figures / diagrams where appropriate.

Note: The final revision of your proposal form should be converted to a **PDF** in your GitLab repo from where it will be automatically collected.