AEROSPACE VISION STATEMENT

//TODO: TEAM NAME

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INTRODUCTION

Aerospace provides technical guidance for all aspects of space systems. Current satellite launches require a team of trained professionals to be alert at all times of the day. However, full 24 hour attentiveness cannot be reasonably expected by human beings. Thus, in order to help Aerospace solve complex space-related science and engineering problems, we strive to solve the issue of drowsiness using facial recognition technology.

PROBLEM STATEMENT

What problem the project is solving?

Aerospace's technical guidance has workers in situations where they need to be alert and respond quickly to changing circumstances. These can be high stakes situations where being drowsy or not paying enough attention could result in something going wrong. We want to provide an automated way for detecting if employees are drowsy or otherwise distracted. Our solution would innovate how detection of tiredness would create a safer work environment and lead to being more productive.

Why the problem is important?

It is critical that the mission control personnel are alert during satellite launches. If they were to become drowsy, they could fail to notice problems that would've been caught had they been fully awake. By notifying the user when he/she is drowsy, potential accidents and mistakes can be avoided. Therefore, this product is important for the successful launch of satellites and safety of personnel in the aeronautical industry.

How the problem is solved today?

Many drowsiness detectors exist in automobile software. One open source solution uses the OpenCV framework, a real-time computer vision library. This program uses facial landmarks to determine if a car driver is drowsy. It calculates a threshold for which the driver's eyes are closed for a sufficiently long time, responding with an audible alarm to alert the driver. One automobile company has a drowsiness detection solution that utilizes an

infrared camera above the steering wheel, detecting more complex signs of tiredness such as frequent blinking, deviations in steering, and distracted head movements. Most of these drowsiness detectors are used for the purpose of keeping drivers alert.

TIMELINE

Sprint 1 ***10/15 – 10/29***

- Create foundation for the design/planning of the project
- Work on proof of concept for the tools we're going to use
- Determine how we will analyze whether someone is drowsy or not
- Determine how we want to process images
- Install framework and libraries for backend processing
- Create an established workflow

Sprint 2 ***10/29 – 11/8***

- Work on basic framework of project
- Work on image processing for data inputs
- Continuous integration with GitHub
- Testing of different ways to determine drowsiness

Sprint 3 ***11/8 – 11/26***

- Integration of individual components of code
- Finalizing best way to process images and determine drowsiness

Sprint 4 ***11/26 – 12/6***

- Work on a presentation of what we've accomplished so far
- Create a demo of our current project
- Create a plan for what we will be adding next quarter

PROJECT MILESTONES

- Code base structure created
- Image processing correctly labels whether someone is drowsy
- Intuitive GUI created to interact with our program

TOOLS

- *Languages:* Python
- *Hardware:* Webcam
- *Framework:* OpenCV, Windows, Mac OS
- *Version Control:* Git, GitHub
- *Project Management:* Trello, Google Drive
- *Communication:* Slack