Meeting Minutes 2nd Sprint

Belgium Campus

DRONE-BASED AI INFRARED HUMAN DETECTION SYSTEM FOR DISASTER RESPONSE: A PROOF-OF-CONCEPT SIMULATION

2023

# Meeting 1

### Date:

12 August 2023

### Time:

19:00

### Attendees:

|  |  |
| --- | --- |
| Sune du Raan | Project Owner |
| Steven Ayensu | Scrum Master |
| Simphiwe Nkgau | Developer 1 |
| Stephanus Mathee | Developer 2 |

## Summary:

The meeting started with the Project owner describing all the requirements for the machine learning model. These requirements consisted of processing an infrared video into frames and pictures of individual instances of humans. These pictures will then be used for human detection The project owner also mentioned possible restrictions regarding the use of an infrared camera to record a video from a drone. Dev 1 suggested the use of dummy data and sparked the idea of creating a video in three-dimensional software for reference data. Dev 2 suggested with his experience in three-dimensional software that he will be able to create a demo video using the three-dimensional animation software called Blender. The scrum master concluded the meeting, and all attendees were satisfied with what were discussed.

### Current Backlog:

|  |  |  |  |
| --- | --- | --- | --- |
| **Perspective** | **Requirement** | **From Sprint?** | **Priority** |
| System user | Create a machine learning model to detect humans | 1 | 1 |
| System user | Display pixel coordinates of detected humans | 1 | 3 |
| System user | Process an infrared video to detect humans | 1 | 4 |

### Topics Discussed:

The machine learning model

### Reports:

The use of positive and negative samples for machine learning model training.  
The use of virtually created training data for the machine learning model due to complications regarding the use of real data mentioned by Dev 1;  
The creation of a demo video created in a three-dimensional animation software presented by Dev 2

### Main Motions:

The motion of constructing a machine learning model using positive and negative data samples motioned by the project owner, and seconded by all attendees. The motion of using a video constructed using Blender was motioned by Dev 2 and seconded by all attendees.

# Meeting 2

### Date:

16 August 2023

### Time:

19:00

### Attendees:

|  |  |
| --- | --- |
| Sune du Raan | Project Owner |
| Steven Ayensu | Scrum Master |
| Simphiwe Nkgau | Developer 1 |
| Stephanus Mathee | Developer 2 |

## Summary:

The meeting started with the Project owner describing a machine learning model that will detect humans by distinguishing them from the background and then getting the coordinates of those humans. She also described Dev 2 suggested the use of different training data. Data that is human and nonhuman to determine if the given picture or detected entity really is a human. Dev 1 agreed and gave the idea of using both models and to compare their efficiency. The scrum master mentioned possible problems regarding the aspect ratio of a camera and human locations. Dev 2 also suggested the use of colour masking too get the coordinates of the detected humans. The scrum master concluded the meeting and all attendees were satisfied with the decisions.

### Current Backlog:

|  |  |  |  |
| --- | --- | --- | --- |
| **Perspective** | **Requirement** | **From Sprint?** | **Priority** |
| System user | Create a machine learning model to detect humans | 1 | 1 |
| System user | Display pixel coordinates of detected humans | 1 | 1 |
| System user | Process an infrared video to detect humans | 1 | 1 |
| Developer | Create video for processing | 2 | 1 |

### Topics Discussed:

The machine learning model

### Reports:

Machine Learning strategy presented by Project owner  
The use of a machine learning model to distinguish humans presented by dev 2  
The use of two models and to compare suggested by dev 1  
The use of colour masking for human location presented by dev 2

### Main Motions:

The use of two machine learning models motioned by Dev 1. And seconded by all attendees.

# Meeting 3

### Date:

20 August 2023

### Time:

19:00

### Attendees:

|  |  |
| --- | --- |
| Sune du Raan | Project Owner |
| Steven Ayensu | Scrum Master |
| Simphiwe Nkgau | Developer 1 |
| Stephanus Mathee | Developer 2 |

## Summary:

At the start of the meeting the project owner presented their machine learning model and also solved the problem of compensating for the aspect ratio of the camera and using an automated drone pathing system for the video. Dev 2 presented their machine learning model and presented a different video processing model using relative pixel pathing and a method of cropping the frames for use in person detection. Dev 1 suggested some ideas for implementing an interface to the program. The scrum master suggested we should focus on implementing an interface to be on the due date.

### Current Backlog:

|  |  |  |  |
| --- | --- | --- | --- |
| **Perspective** | **Requirement** | **From Sprint?** | **Priority** |
| System user | Create a machine learning model to detect humans | 1 | 1 |
| System user | Display pixel coordinates of detected humans | 1 | 1 |
| System user | Process an infrared video to detect humans | 1 | 1 |
| Developer | Use colour masking for easy processing and frame cropping | 2 | 1 |
| Developer | Create video for processing | 2 | 1 |
| Developer | Finish Machine Learning Models for Testing | 2 | 1 |

### Topics Discussed:

User experience

### Reports:

A method of using a predetermined path for video capture presented by the project owner.  
A method of dealing with the aspect ratio of the camera and locating humans presented by the project owner.  
An alternative method of processing the video and cropping detected objects for human detection presented by Dev 2  
User interface ideas regarding the allocation of the path presented by Dev1

### Main Motions:

The motion to continue with the user interface was motioned by the scrum master and seconded by all other attendees.

# Meeting 4

### Date:

20 August 2023

### Time:

19:00

### Attendees:

|  |  |
| --- | --- |
| Sune du Raan | Project Owner |
| Steven Ayensu | Scrum Master |
| Simphiwe Nkgau | Developer 1 |
| Stephanus Mathee | Developer 2 |

## Summary:

The meeting started with all attendees giving their ideas regarding the interface of the program. The project owner presented their interface demo. The demo consisted of a simple video upload and output of a graphical presentation of the locations of the humans and numbering of the instances, as well as the coordinates for each instance. It was decided to go with their idea and build upon it. The scrum master concluded the last meeting before the due data and told everyone to finish their implementation and upload it to the required destination for evaluation.

### Current Backlog:

|  |  |  |  |
| --- | --- | --- | --- |
| **Perspective** | **Requirement** | **From Sprint?** | **Priority** |
| System user | Display pixel coordinates of detected humans | 1 | 1 |
| System user | Create appropriate User interface | 2 | 1 |

### Topics Discussed:

User experience

### Reports:

Use of a user interface to upload a video and present the locations of the humans graphically was presented by the Project owner.

### Main Motions:

The motion to use the proposed demo user interface and build upon it for the final submission was proposed by the scrum master.