May 17th, 2022

Product Requirements Document

Version 1.0

Project Wall-E

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Product Requirements Document

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# Objective

|  |  |
| --- | --- |
| Vision | Project Wall-E is intended to be a land rover to operate on Mars as well as throughout the United States in hard-to-reach areas where humans cannot sustain life or travel. The vision of Project Wall-E is to provide better and smarter control over todays robotics utilizing the latest and most advanced software. The original intention is to provide stronger and more controlled space aviation given large distance. Applications for Project Wall-E public sector is endless and can provide many applications to everyday citizens involving rapid-transportation, remote engineering, and access to uninhabitable environments. |
| Goals | The goal of the project is to emulate a rover and real-life teleportation using virtual reality. If the control system for the rover is through VR the system will work optimally. Additionally, we can highlight objects and improve functionality by using neuro networks to perform human tasks more precisely. |
| Initiatives | * Implementation of neuro network to spot walls and objects to obtain * Virtual Reality control system to emulate robotic teleportation * Long-distance high-speed connectivity for control through satellite * Fully controllable and environment viewing specs attached to robot |
| Persona(s) | The project is initially designed to help people on earth or space connect with each other over long distances through a physical controllable system. |

# Release

|  |  |
| --- | --- |
| Release | The project is initially designed to help people on earth or space connect with each other over long distances through a physical controllable system. |
| Date | The projected release data of prototype 1 is due June 5th, 2022 |
| Initiative | The initiative of the first release of the prototype is to include:   * Functioning rover with implemented motors * Input and output from computer to Arduino/RaspberryPi wirelessly * Connectivity to components through two networks |
| Milestones | * Control RaspberryPi remotely using RPI GPIO (5/20/2022) * Implement motor control * Mount setup to rover * Implement camera through RPI GPIO to remote device |
| Features | *Prototype 1 Features*   * Remote control of output through Arduino/RaspberryPi * Components mounted inside prototype * Remote camera output to operating device |
| Dependencies | *Dependencies of release*   * Raspberry Pi 4 * Video camera * Arduino Uno R3 * Arduino/ Raspberry Pi rover base * Motor connected to circuits * Servo motor connected to circuit |

# Features

|  |  |
| --- | --- |
| Feature | *Feature or user story name* |
| Description | *Description of what the new feature will do* |
| Purpose | *Task or action the user wants to accomplish* |
| User problem | *Pain point or challenge* |
| User value | *How the proposed solution helps the user* |
| Assumptions | *Business, user, or technical assumptions* |
| Not doing | *Anything that is out of scope for this feature* |
| Acceptance criteria | *Conditions of acceptance* |

# User flow and design

*Insert wireframes and mockups.*

# Analytics

*Hypothesis: Using two cameras will help translate to Virtual Reality to increase control of rover.*

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| --- | --- | --- | --- |
| Key performance indicator | Baseline | Target | Timeframe |
| 1280x720 cameras must operate at latency of 0.046ms(30 fps per camera) | The baseline of operations involves a minimum of 30fps/ 0.023 ms latency. | The preferred latency for operations per camera will be 0.023 ms/60 fps. | 6/10/2022 |

# Future work

|  |  |  |  |
| --- | --- | --- | --- |
| Future features | Purpose | Priority | Timeframe |
| Cameras output to VR headset/ web | Increased control/ teleportation | Must Have | H 6/ |
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