# Project Charter

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| Project Identification | |
| **Name or Title** | Air Canvas using Python |
| **Description** | Air canvas refers to a technique for creating interactive graphics, animations or visual effects in the air using hand gestures. This can be achieved using computer vision and machine learning algorithms that track hand movements and interpret them as inputs for creating or manipulating digital elements in real-time. In Python, you can implement air canvas using libraries such as OpenCV, which provides computer vision algorithms for detecting and tracking hand movements, and Pygame, which is a popular library for creating games and animations. To implement air canvas in Python, you would typically perform the following steps: Capture video from a camera: Use OpenCV to capture video from a camera or a webcam. Preprocess the video: Preprocess the captured video to isolate the hand region and eliminate background noise. Detect and track hand movements: Use OpenCV's object detection algorithms to detect the hand in the video and track its movements over time. Map hand movements to digital elements: Map the hand movements to the parameters of digital elements such as shapes, colors, and animations. Render the digital elements: Use Pygame or a similar library to render the digital elements and create the air canvas. Interact with the digital elements: Use hand gestures to interact with the digital elements and control their behavior. While this is a high-level overview of the process, the implementation can become quite complex, especially if you want to add additional features such as multiple hands, gesture recognition, and more. However, with the right resources and some programming skills, it's possible to create a working air canvas in Python. |
| **Project Sponsor** | NA |
| **Project Manager** | NA |
| **Start Date** | 01/02/2023 |
| **Finish Date** | 20/07/2023(Tentative) |
| **Estimated Budget** | NA |

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| **Project OBJECTIVES (purpose)** |
| The primary goal of this air canvas project is to analyze the possibilities of computer vision technology in order to develop an innovative and user-friendly digital canvas. Our goal is to design a software system that employs computer vision algorithms to track a user's hand motions and allows the user to interact with the digital canvas using hand gestures, allowing them to create and control digital material more intuitively. The user may, for example, use their hand to draw or paint on the canvas, or to manage the location and size of digital objects. Evaluating the user experience and performance of the air canvas system, and improving it based on user input. This requires gathering input from users and previous research, interpreting user data, and creating system modifications based on the results. The goal is to develop a system that is intuitive and simple to use, while also providing a satisfying user experience and more accurate results. |

| **Project's criteria for success (must be measurable)** |
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| **Accuracy of Hand Tracking:** The accuracy of hand tracking should be measured and evaluateby achieving a high degree of precision and responsiveness. This can be measured by tracking the position of the hand and comparing it to the expected position. |
| **Ease of use:** The air canvas system should be simple to use and accessible, allowing a wide variety of people to participate regardless of technique and skill. This may be evaluated by gathering user input and measuring the system's capacity to be effectively utilized by a large set of users. |
| **Performance**: The performance of the air canvas system should be fast and efficient, allowing for smooth and seamless interaction with the digital canvas. |
| **System Reliability:** The air canvas system should be reliable, with few crashes, errors, or other problems. This may be monitored by keeping track of system performance and any difficulties that develop during use. |

| **Project SCOPE - HIGH LEVEL (INCLUDE PRODUCT AND PROJECT MANAGEMENT SCOPE)** |
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| **Requirements Gathering:** Gathering and documenting the requirements for the project, including the functional and non-functional requirements for the predictive model, the user interface, and the data analysis components. |
| **Deployment and Maintenance:** Once the air canvas system has been created, it must be implemented, and regular maintenance must be performed to assure its sustained operation and performance. This may include bug fixes, software updates, and the addition of new system features. |
| **Testing and Quality Assurance:** It is essential to ensure that the product satisfies the necessary standards and is dependable. Conducting various types of testing to identify and address any issues before the product is released. |
| **Reporting**: Reports must contain detailed information about the project's progress and timetable and must be presented in a clear and simple way. |
| **User Training**: Providing training to the hiring managers and other stakeholders on how to use the system and interpret the results. |
| **Compatibility**: The air canvas system should work with a wide range of operating systems and devices, including smartphones, tablets, and desktop PCs. This enables users to access and operate the air canvas system from any device. |

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| **key Project DELIVERABLES** | |
| **Name** | **Description** |
| Predictive Model: | Neural Network |
| Documentation: | Business Case, Business Proposal, Python Notebook, Library Documentation. |
| Project Report: | Business Charter |
| User Interface: | Python IDE, Jupyter Notebooks, Anaconda |

| **HIGH-LEVEL SCHEDULE** | | |
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| **Item** | **Major Events / Milestones** | **Dates** |
| 1.1 | Project Initiation: Define the project objectives, scope, constraints, risks, and stakeholders. | 15th Feb 2023 |
| 1.2 | Planning: Develop a project plan including a schedule, budget, resource allocation, communication plan, and risk management plan | 25th Feb 2023 |
| 1.3 | *Execution: Implement the project plan, manage project activities, and track progress.* | 1st March 2023 |
| 1.4 | Monitoring and Controlling: Monitor project progress against the project plan, identify deviations, and take corrective action. | 20th April 2023 |
| 1.5 | Project Closure: Complete project activities, obtain sign-off from stakeholders, and conduct a project evaluation. | 15th July 2023 |

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| **CONSTRAINTS (Time, budget AND TECHNICAL)** |
| **Constraint Description** |
| Time: Given the time interval of 7 months it will be a constraint to train a computer vision model with very high accuracy that can track and identify hand movements, Time will also play an important factor in achieving and procuring the right skill sets that are required to code an Air Canvas that can have different features like colors and modes. |
| Technical: There will be quite a number of technical barriers while being able to get the model working as there are different python libraries available for computer vision and what suits and gives best results for our desired output. Learning new technologies to be able to train and build the model will also be a technical constraint for this project. |
| Budget: NA |
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| **Assumptions** |
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| **Description** |
| **Availability of Resources:** As needed, resources such as personnel, funding, equipment, and information, will be available as needed to complete the project. |
| **Regulatory Factors**: Regulatory requirements and compliance with privacy, data protection, and security laws, including data storage, processing, and transmission assumptions. |
| **Performance:** It can give accurate hand movement detection, user friendly interface, real time processing and meeting the specified timeline. |
| **Schedule:** Project will be completed within the defined timeline and budget constraints. |

| **RISKS** |
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| **Description** |
| **Schedule and Budget:** There is a risk that the project may exceed the defined timeline and budget constraints, which could negatively impact the overall success of the project. |
| **Technical Risks:** There is a risk In technology such as complexity of the software, stability of the technology due to this there is a chances it may not work as expected. |
| **Quality risks**: These are risks related to the quality of the software, such as poor performance, poor reliability, poor hand movement deduction, or poor usability. |
| **Access to Resources**: Limited access to resources, such as software or hardware, can impact the project's timeline and outcome. |

| **Signoff** |
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