

Project Design Phase-I Proposed Solution Template

Date	19 September 2022
Team ID	PNT2022TMID53208
Project Name	Project - A Gesture-based Tool for Sterile Browsing of Radiology Images
Maximum Marks	2 Marks

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The use of doctor-computer interaction devices in the operation room requires new modalities that support medical imaging manipulation while allowing doctors' hands to remain sterile, supporting their focus of attention, and providing fast response times. Therefore, a gesture recognition system that interprets user's gestures for manipulation of medical images is proposed.
2.	Idea / Solution description	The data is to be collected by observing intuitive gestures in different lighting environments by video capture. The data is then sampled, cleaned and segmented and passed into a Convolutional Neural Network which then identifies the gestures. Following this, stacking is performed to give higher accuracy using algorithms such as SVMs and GMMs.
3.	Novelty / Uniqueness	The project proposes classification of hand images depicting a particular number for an operation, ex., 2 for zoom out. Instead, a temporal model, depicting real time gesture for an operation, ex. moving index finger left for left swipe, can be implemented to ease the interaction which thus forms a scope for uniqueness for the project.
4.	Social Impact / Customer Satisfaction	The ability to interact through patient medical images in a sterile format augments the attention of the surgeon towards surgery. The surgeon need not change location in order to browse images, but can do it remotely. Further, inconveniences caused in physical interaction, being possible mode for infection spread, is now solved.
5.	Business Model (Revenue Model)	The system when developed and tested for accuracy, can be given to various hospitals for practical testing for a particular period. They can later be persuaded to purchase once the test period is done. Further, to capitalise and market it as a software product, direct sales to hospitals and surgeons must be made. Revenue sources include direct sales via demo and sales via purchase after testing.
6.	Scalability of the Solution	Numerous hospitals in the present date, follow only physical mode of interaction with images during surgery. But the need for sterile browsing is intact and vital. This explains that the model has immense scope to be scaled and distributed among various surgeons. Additionally, the model can be improvised to perform more functions than interactions, such as automatic and consecutive fetching of related images, ex. If an image of shoulder blade is inspected, more likely hand will also be inspected.