Eye2Eye

Making Video-Conferencing more realistic, one frame at a time!

Ministry: Department of Science & Technology
Problem Statement: PR324
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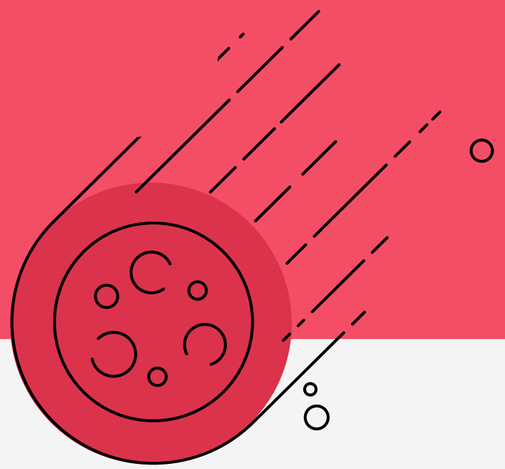
Problem Statement

A common problem in video calls is the failure to build eye contact as the screen and camera are misaligned. As users have tendency to look at the screen and not the camera, the communication flow is misaligned and thus, unnatural. While many alternative solutions have been developed, which often put the camera behind the screen, or use mirrors to correct the alignment, we propose an ML based solution that solves the problem at minimal cost.

Solution

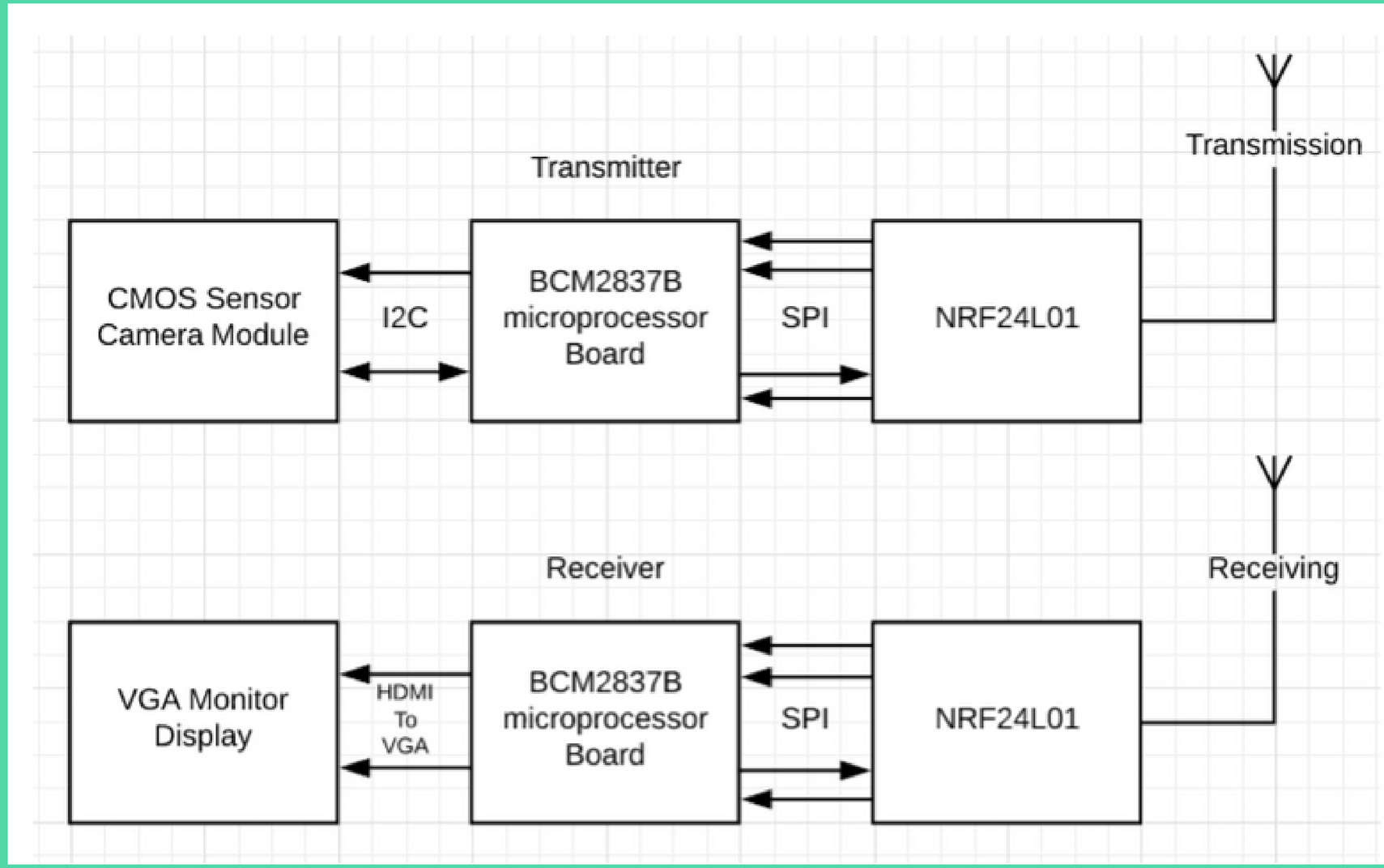


1 ML Model:
Used for Head Pose Estimation followed by replacing the misaligned eyes with AI generated aligned gaze eyes to give effect of eye to eye conversation.

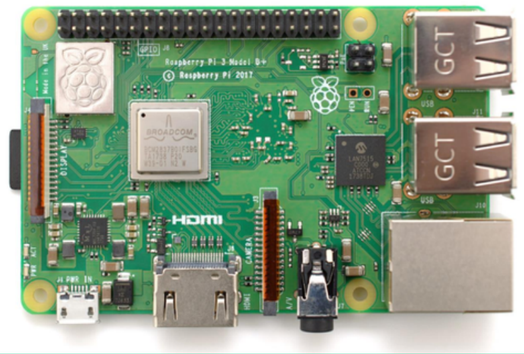
2 Security & Communication Layer:
Providing real time secure communication to give optimum call experience without compromising privacy

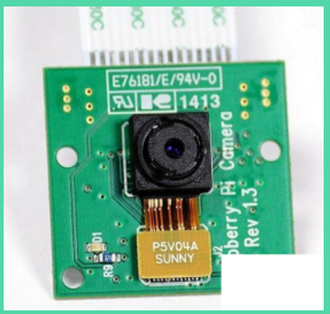
3 Optimization:
Effective image compression using High Efficiency Image Coding (HEIC) to ensure availability of bandwidth.

Hardware Representation



3.2.2 BCM2837 Microprocessor Board





3.2.4 HDMI To VGA Convertor

Use Cases

1 Effective communication in meetings and virtual classrooms.

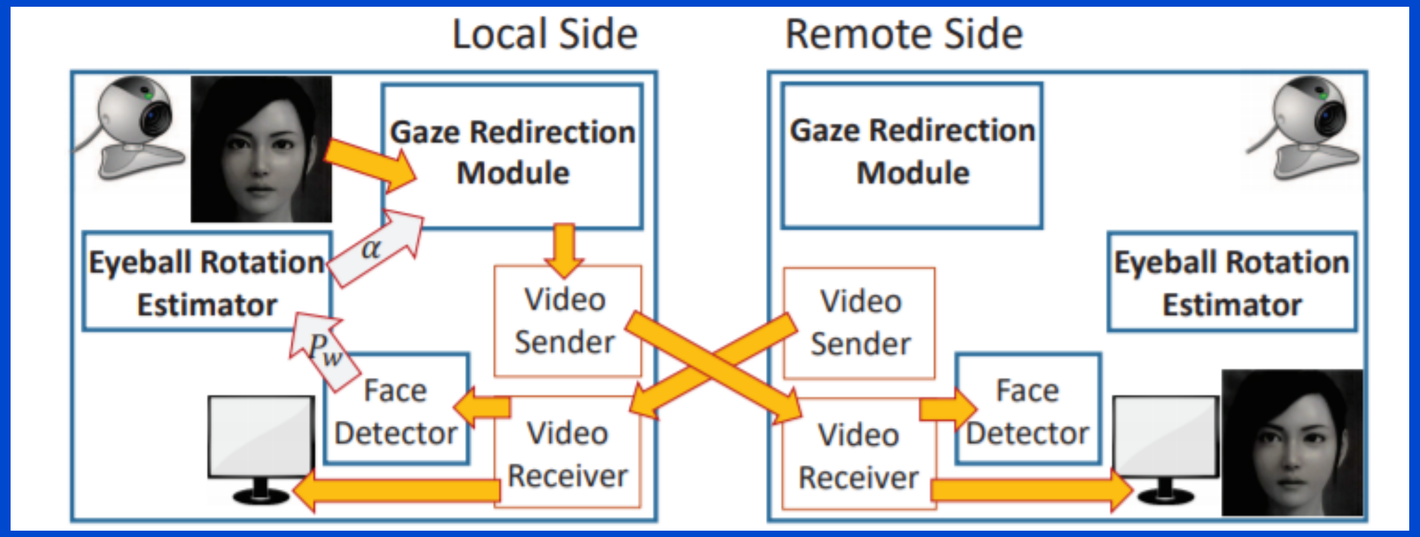
2 Realistic and natural commmunication.

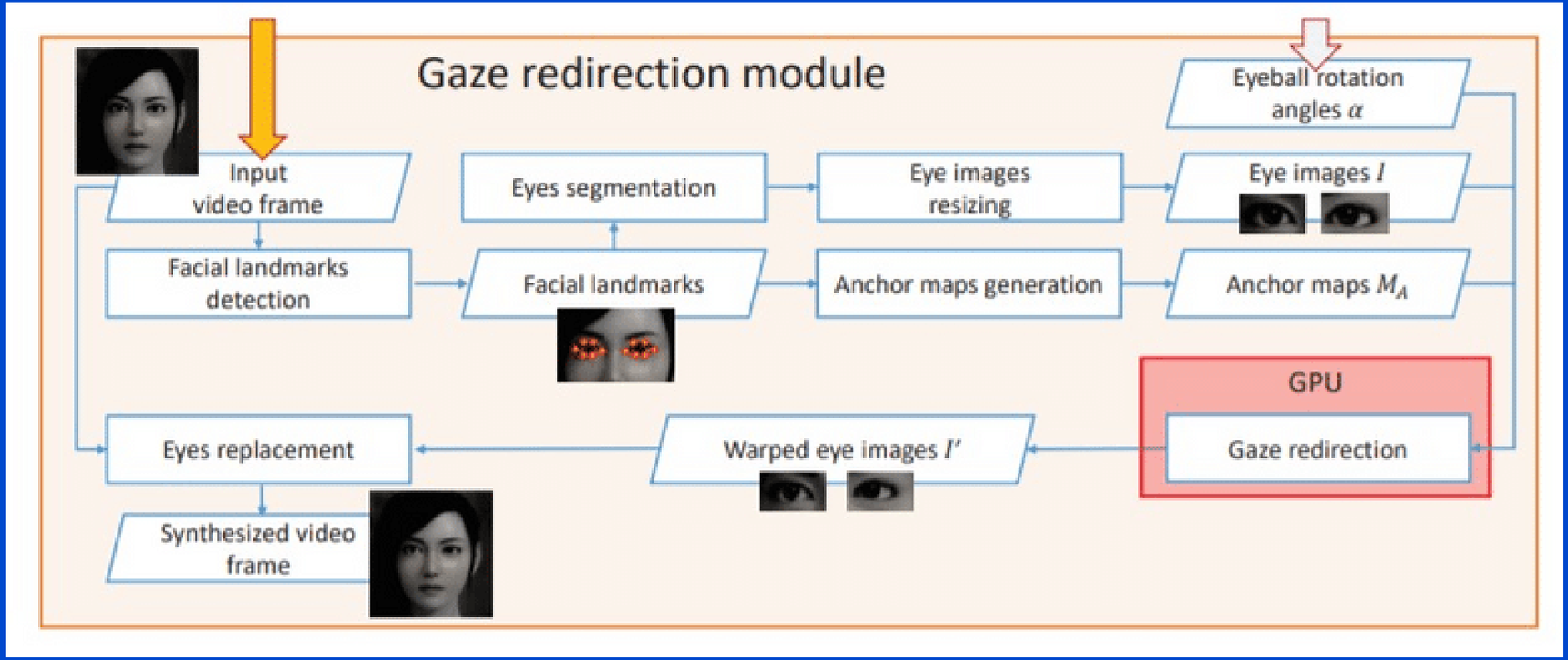
3 Improves engagement and attention of audience.

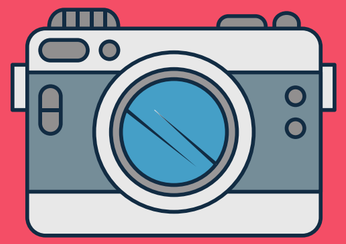
EYE2EYE

ML Model

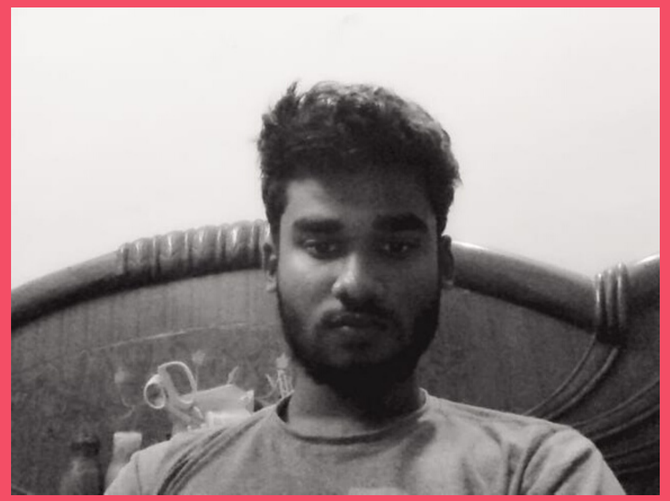
A brief summary of the working of ML model

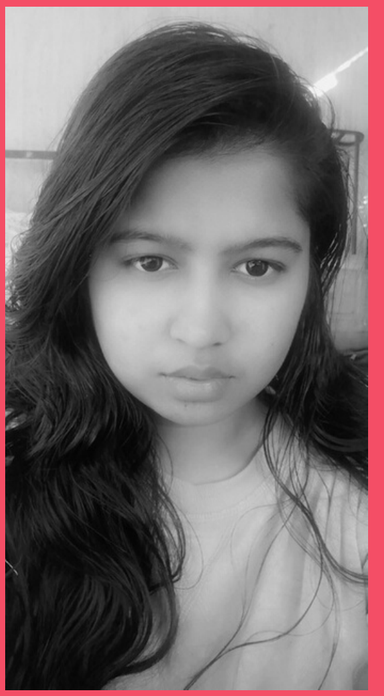


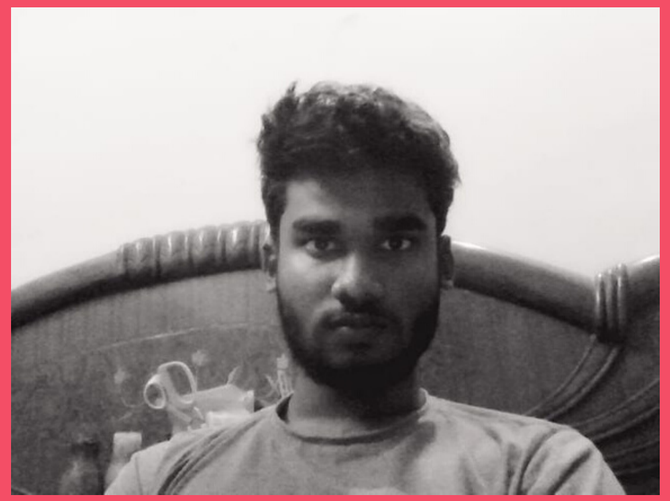


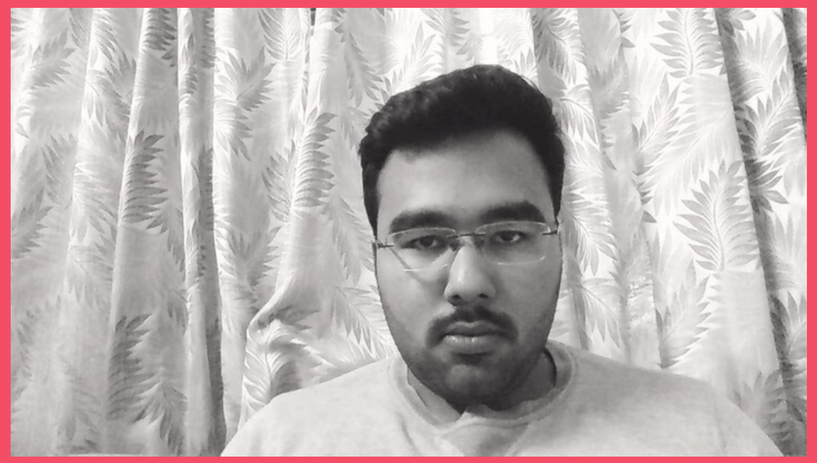


Our Model Correcting Eye Gaze









Showstoppers

1. Use of state of the art Deep Learning techniques, such as GANS, transfer learning,etc. for test case generation and training of neural network models.

2. Use of RTSP/RTMP protocols to ensure real time secure communication for both parties.

3. HEIC (High Efficiency Image Coding) protocol for speedy and effective compression of image data minimizing buffering in calls.