Yoga

We basically built an algorithm which can perform 2 tasksI) If as a user you are watching a yoga video, but you don't know the name of the yoga pose he/she is performing. You can upload the video and the algorithm will detect the yoga pose and tell you.ii) Suppose you know what yoga pose you are performing, but you want to know if you are performing them correctly according to general standards. You can upload the video and the code will quantitively give you feedback of each joint

We can use this and built an app for self-guided yoga practice, where in user can learn from his/her mistake as well as improve his/her yoga knowledge

We were a team of 2 and a senior mentor who guided us in this project, UGP under Tushar Sandhan sir, so the we were both into the project from start to end, from reading research paper to collaboratively writing code to final presentation. There is no work demarcation.  
  
Getting into tech.

First and fore most pose estimation – We had two options Media Pipe or Open pose.  
We choose media pipe because, it was computationally cheaper and easier to implement, Our user is not moving fast and also we also don’t need multi human pose estimation, so our use case is a simple one, hence media pipe

For the first part, yoga pose detection, as you could guess we had to build a deep learning model.  
We used CNN along with LSTM to build our Neural Network.  
  
Why CNN, well our input is a video, which is basically images in fast succession, we had to choose CNN.  
We had option of 3D – CNN, e.g. ID3, C3D, but we preferred to go with basic CNN  
  
Why LSTM, we needed to capture long term dependencies, but not too long, hence we avoided transformer based models  
We did not use TCN – Temporal Convolutional Network, as we are not focusing on real time prediction, we don’t require to have high latency and speed  
  
We have already extracted valid information in terms of joint positions hence Conv1D is used and also ConvLSTM is not used as it operates on 2D data ie. images or heatmaps

For the second part we used vector analysis  
Found intermediate poses, compared use’s joint angle with those intermediate poses as we moving along achieving those intermediate poses

Result  
99.05percent accuracy  
Polling -