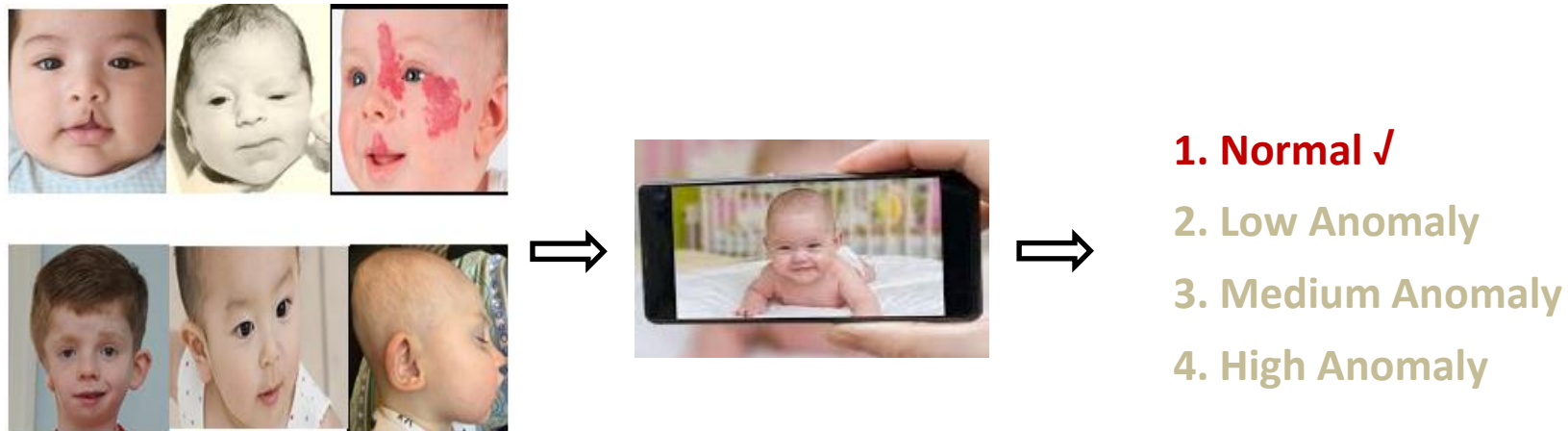


# Face Anomaly

# Our Deep Learning Enabled Face Anomaly Mobile App



Helps Doctors in Better Decision Making for Pre- and Post-Surgery Patients with Craniofacial Anomaly



# Facial Anomaly

>> Occurs in approximately 1 per 500-700 births worldwide



## Impacts:

- ▶ Individuals
- ▶ Their Families
- ▶ Society

# Difficulties in Assessment



Before Surgery



After Surgery



Normal Face



Any Deviation?

Expert A: 20%

Expert B: 10%

Lay Person: 15%



# Difficulties in Assessment



Before Surgery



After Surgery



Normal Face

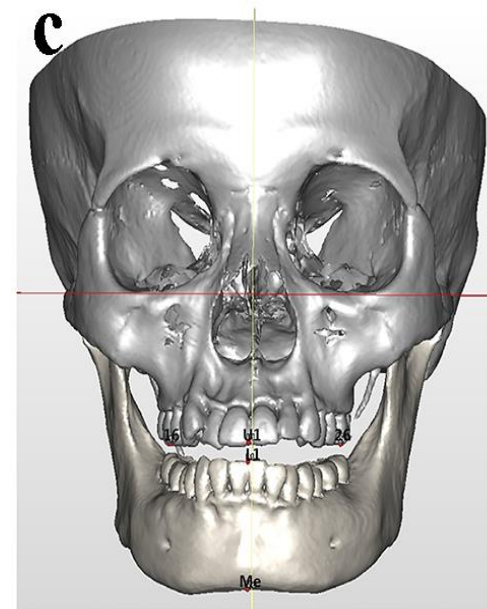
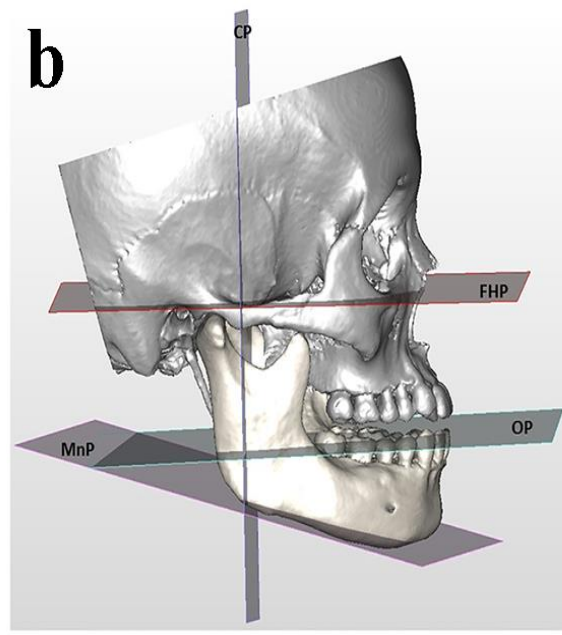
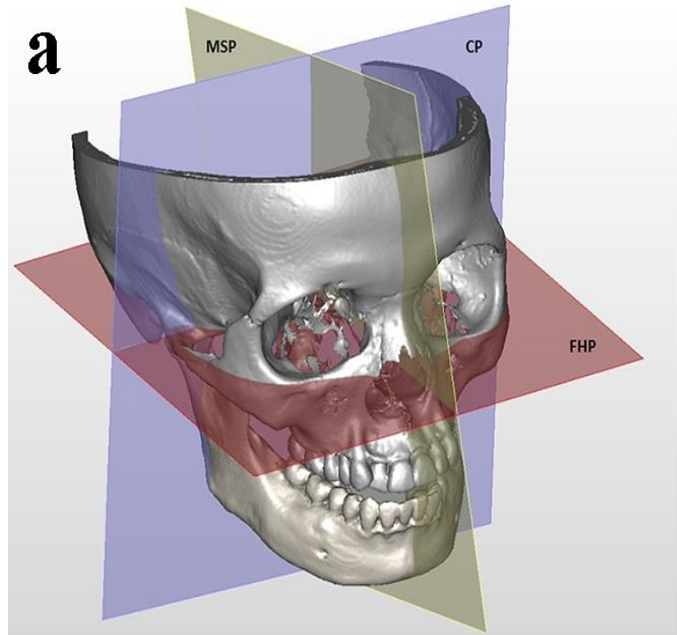


Any Deviation?

- ▶ Non-quantitative
- ▶ Subjective

# Difficulties in Assessment

- ▶ Complex Exam
- ▶ Time Consuming
- ▶ Costly

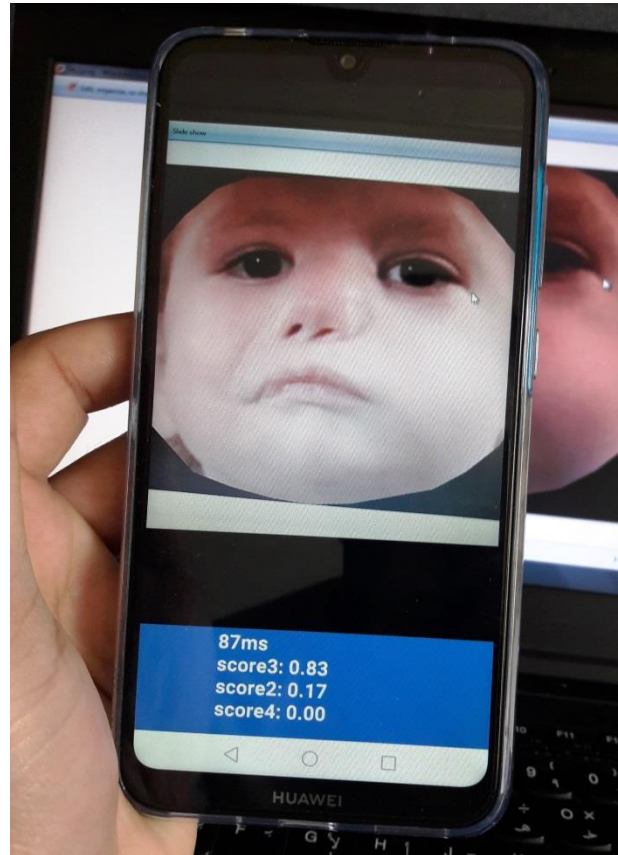




# Our Solution: Face Anomaly Mobile App



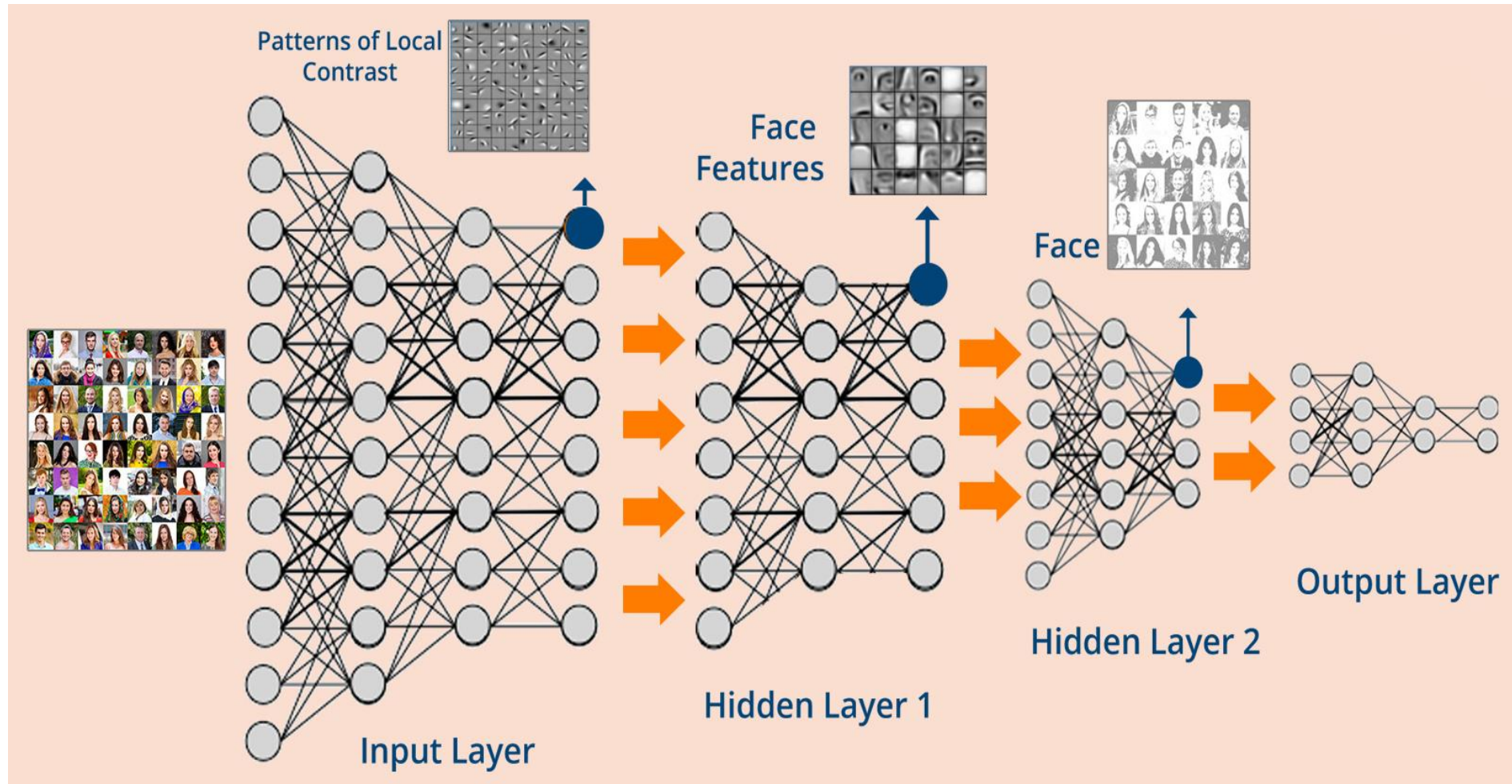
Capture Face Image



Provide Anomaly Level

- ▶ Real Time
- ▶ Simple
- ▶ Non-subjective
- ▶ Quantitative

# How does it work: Deep Learning





# Deep Learning on Mobile: MobileNets



# Data Sample

Anomaly Score: 1



Anomaly Score: 2



Anomaly Score: 3



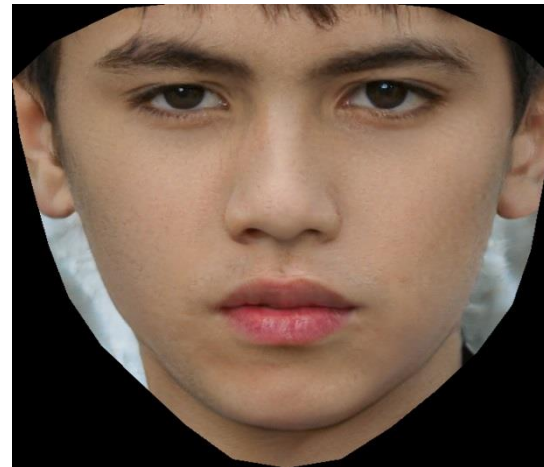
Anomaly Score: 4



Anomaly Score: 5



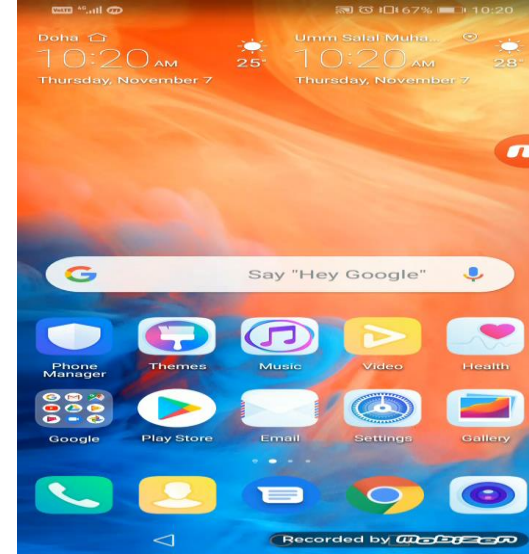
Anomaly Score: 7





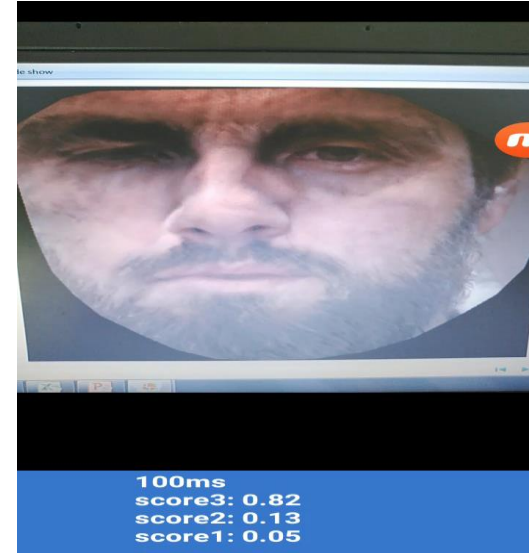
# How does it work: Demo 1

- ▶ Before Surgery
- ▶ True Score: 1



<<- Our Score

- ▶ After Surgery
- ▶ True Score: 3

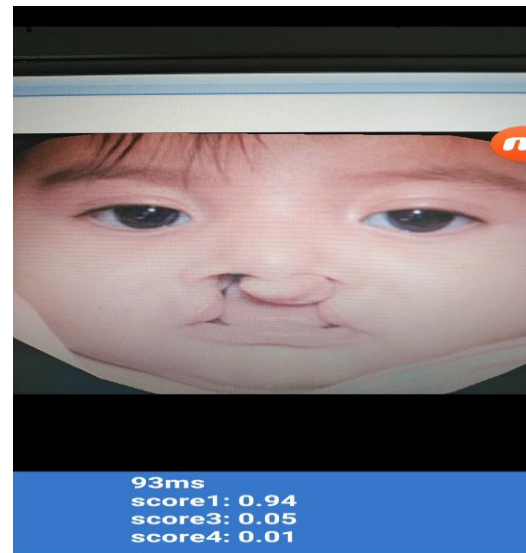


<<- Our Score



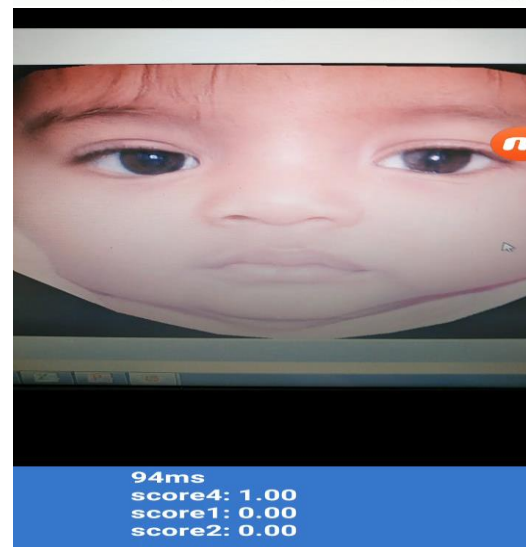
## How does it work: Demo 2

- ▶ Before Surgery
- ▶ True Score: 1



<<- Our Score

- ▶ After Surgery
- ▶ True Score: 4



<<- Our Score



# 12 Month Prototyping Plan

A high level Budget (QAR) breakdown of the project

Category	1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter	Total Cost
Equipment, Consumables	2,500	2,500	2,500	1,000	8,500
Human Resource	10,000	10,000	10,000	10,000	40,000
Miscellaneous	500	500	500	--	1,500
Total	13,000	13,000	13,000	11,000	50,000

Key Milestones	Time
Collecting CFA Data	Jan, 10, 2020 - May, 31,2020
Developing deep learning architecture	March, 1, 2020 - Aug, 30, 2019
Developing Mobile App	Sept.,1, 2019 - Dec,31, 2020





# Our Team



Md Shafiqul Islam  
PhD Candidate, CSE, HBKU  
Research interest:  
Machine Learning



Dr. Marwa Qaraqe  
Assistant Professor  
CSE, HBKU, Expertise in  
Machine Learning



Dr. Mitchell Stotland  
Division Chief  
Plastic and Craniofacial Surgery  
Sidra Medicine



# Thank You

