Saving Face: A Gesture Recognition Application to Fight the Spread of COVID-19

mit media lab

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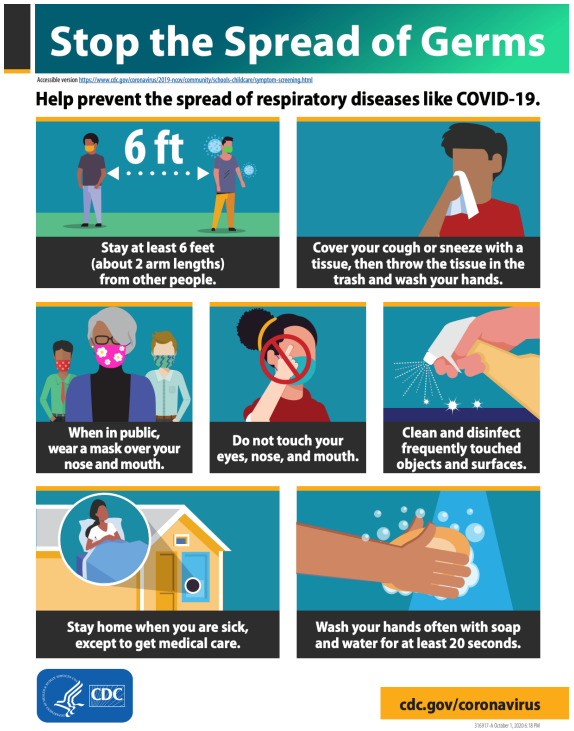
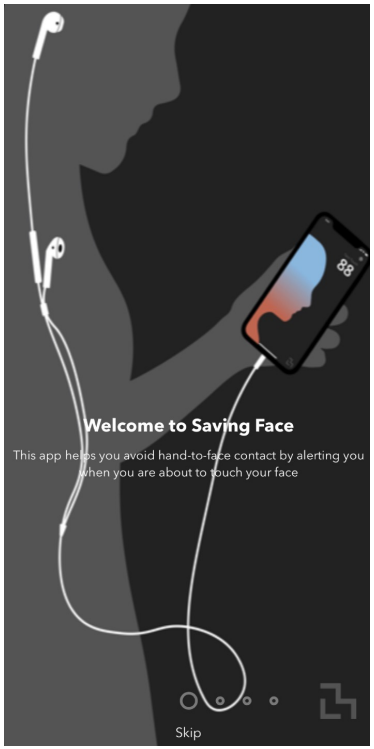
Background



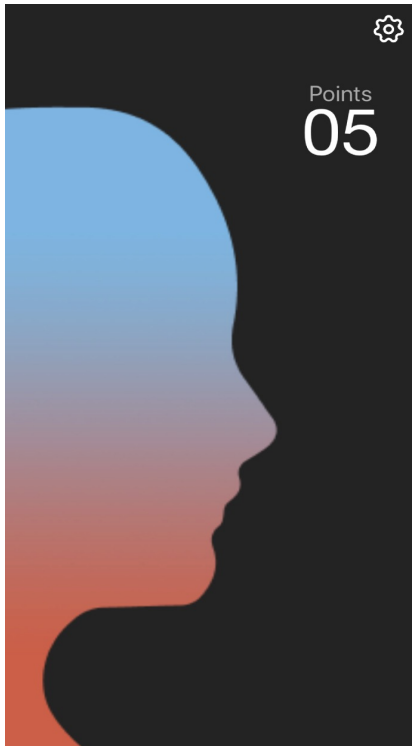
Guidance from the WHO and CDC to reduce hand-to-face contact

Saving Face Mobile Application

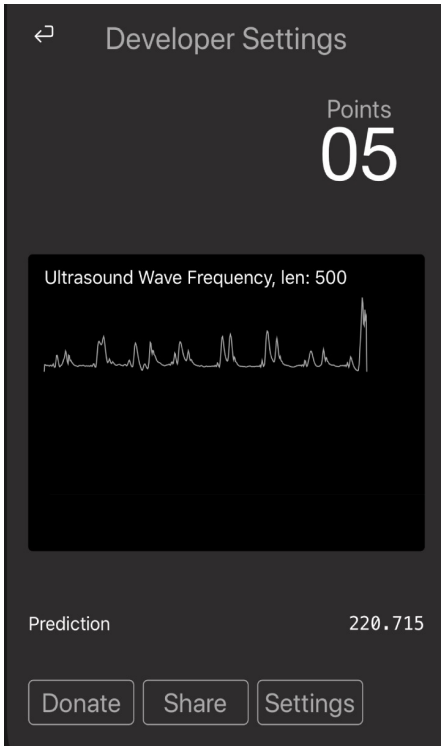


(a)

(b)



(c)



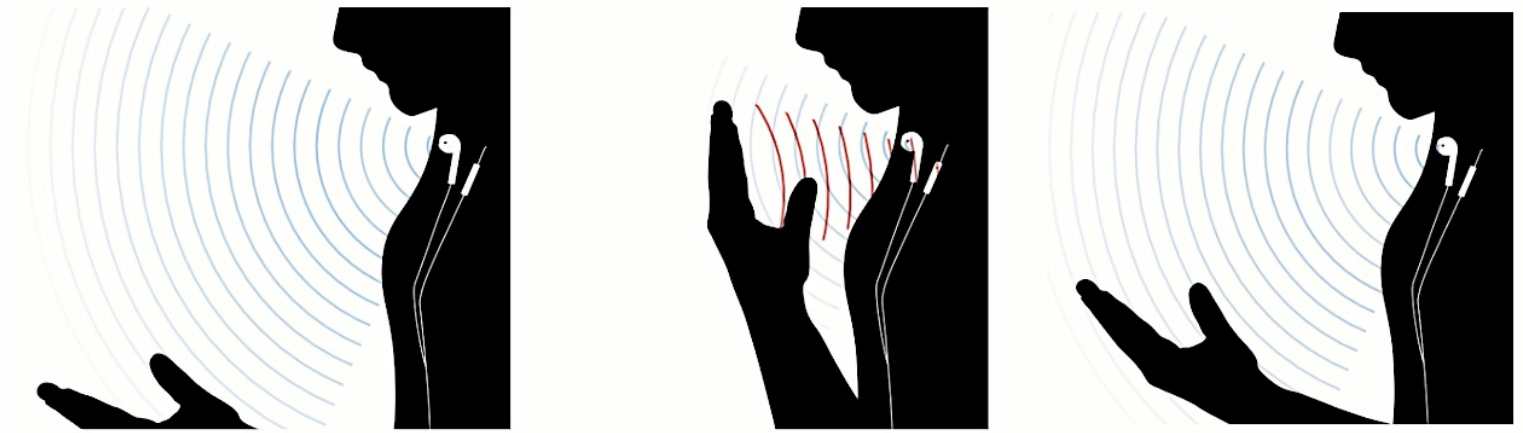
(d)

Saving Face onboarding pages and user interface

Overview

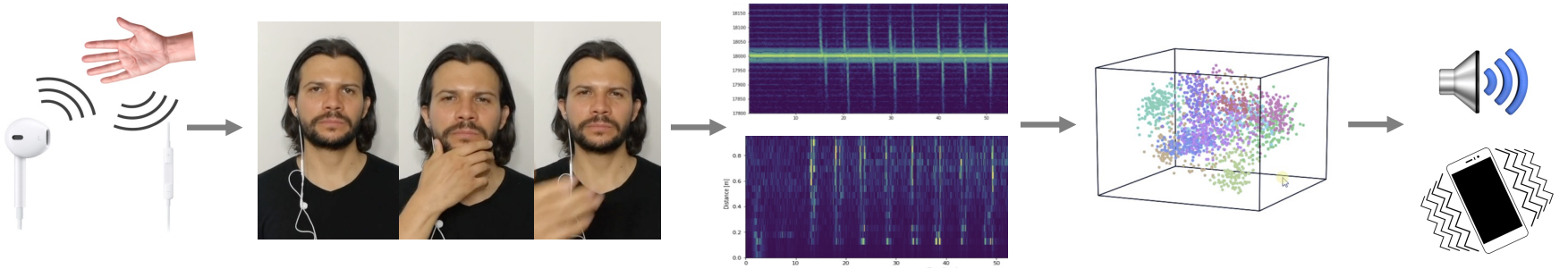

1.
Designing the System
2.
Processing the Data
3.
Building the Dataset
4.
Developing the Model
5.
Conducting User Studies

Working Principle



Saving Face transforms a pair of wired earbuds into a sonar system

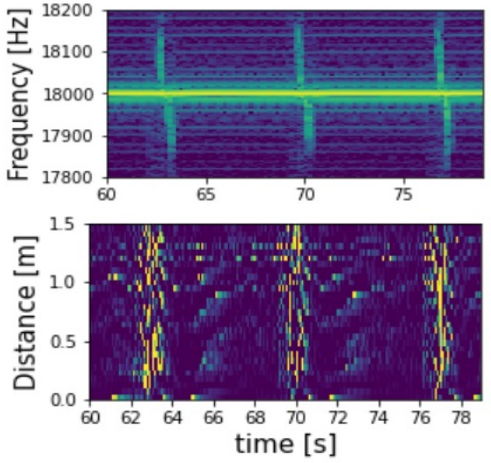
1. Designing the System



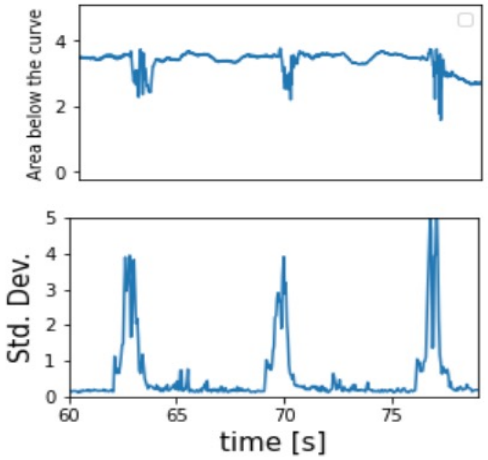
(a) Sonar System (b) Ultrasound Sensing (c) Signal Processing (d) Gesture Detection (e) Feedback

Design and implementation of the Saving Face system

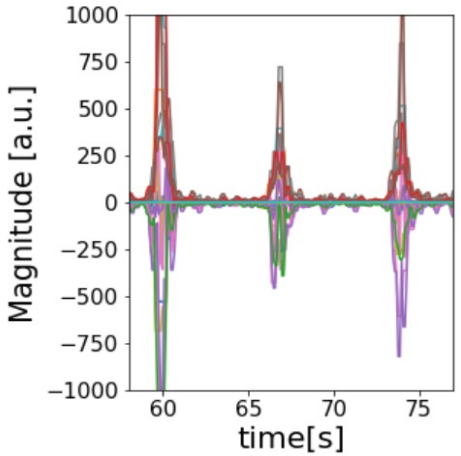
2. Processing the Data



(a) Generating Spectrograms



(b) Extracting Features

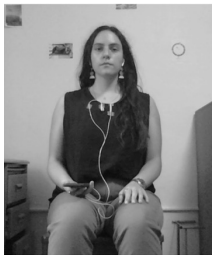
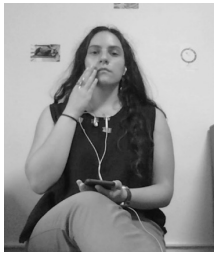
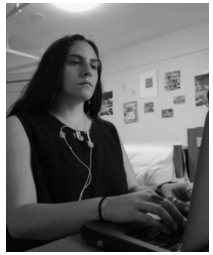


(c) Convolutional Filters

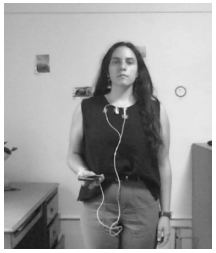
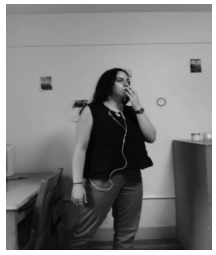
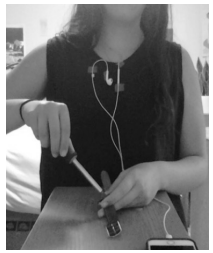
Characteristic patterns of a face touch gesture at three main stages of processing

3. Building the Dataset

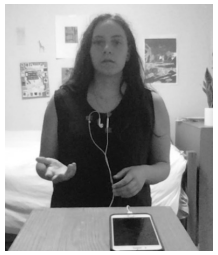
Office

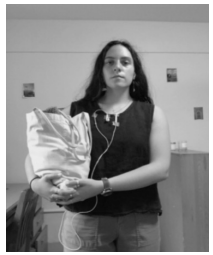




Manufacturing

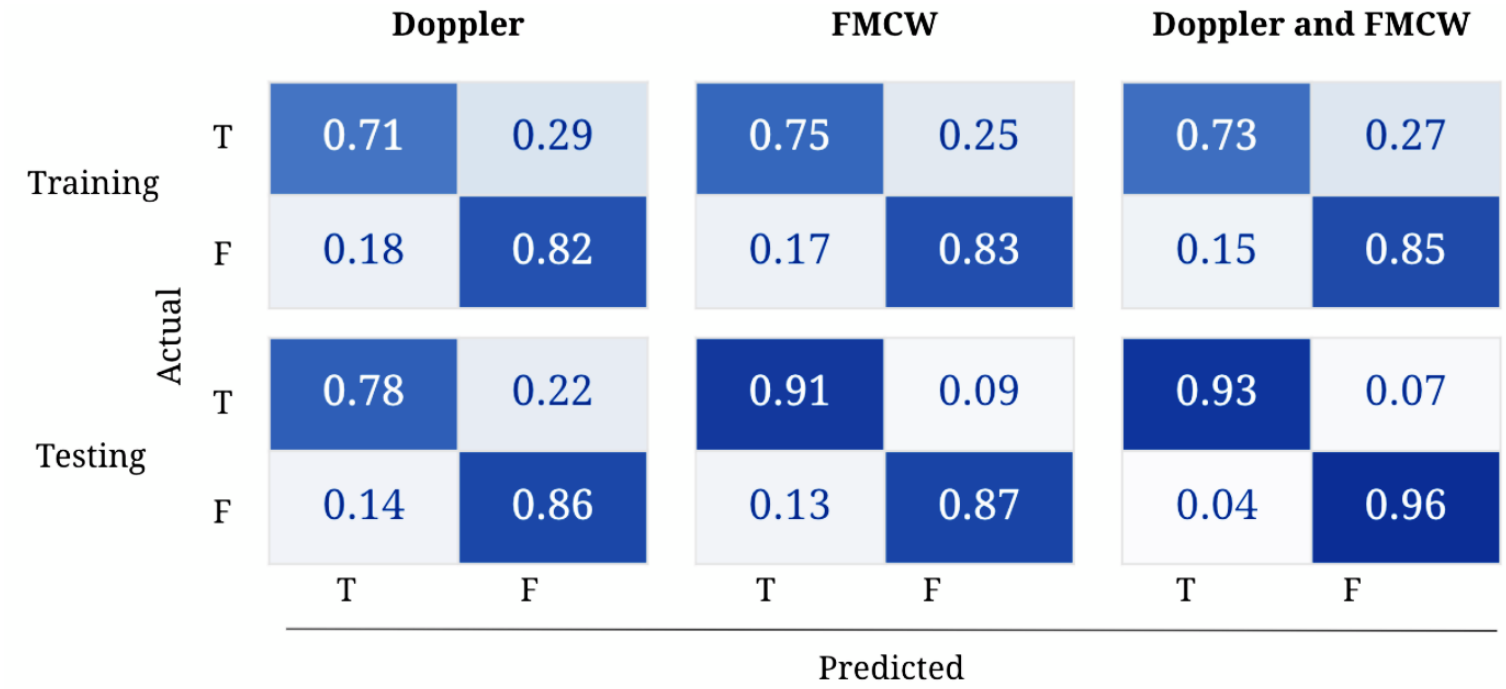
Supermarket





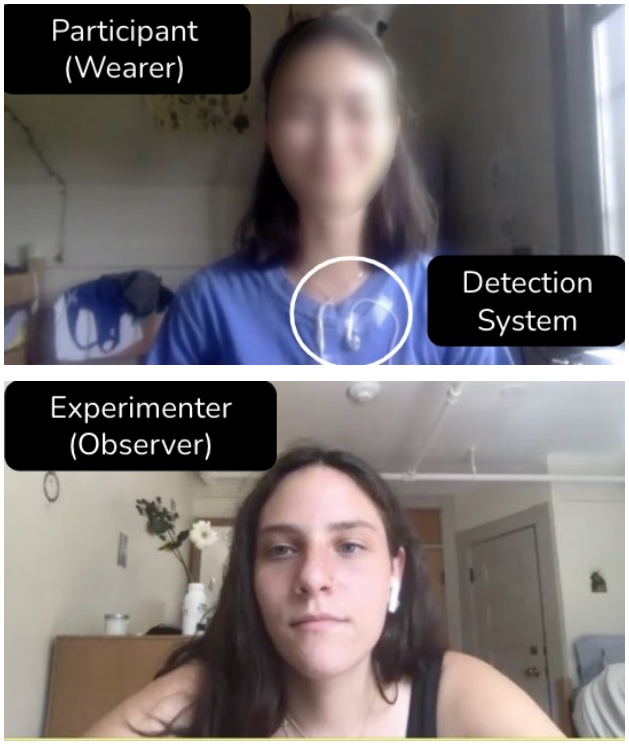
Nine different tasks used to train the machine learning model

4. Developing the Model

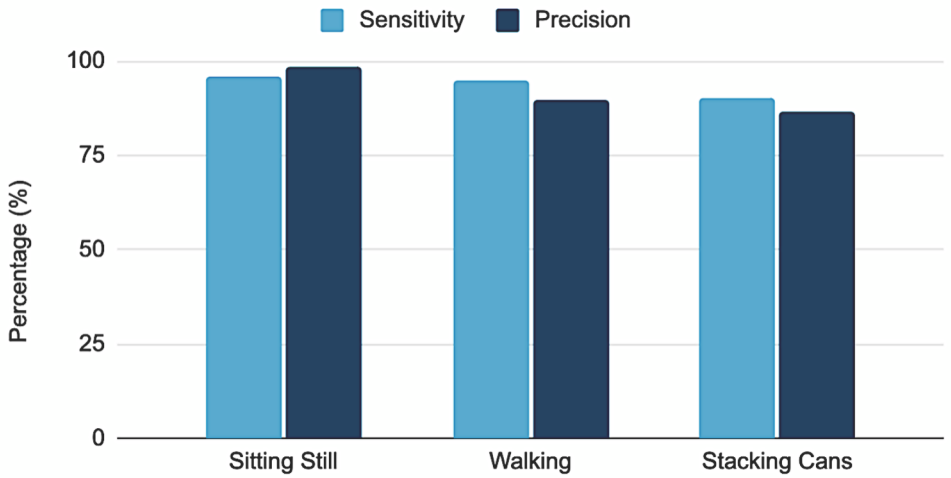


Evaluation of the machine learning model

5. Conducting User Studies



User Study Setup and Design



Sensitivity and Precision measured during user studies

Acknowledgements

- Thanks to the Saving Face Team and MIT Media Lab [1]

- Contact: savingface@media.mit.edu

Paper: Scalable Solution for Signaling Face Touches to Reduce the Spread of Surface-based Pathogens (IMWUT Vol 5, Issue 1) [2]

[1] https://www.media.mit.edu/projects/saving-face/people/ [2] https://dl.acm.org/doi/10.1145/3448121