Track	Research Poster – a booth at the poster presentation reception on June 2
Session Title	Let's CURB Domestic Violence
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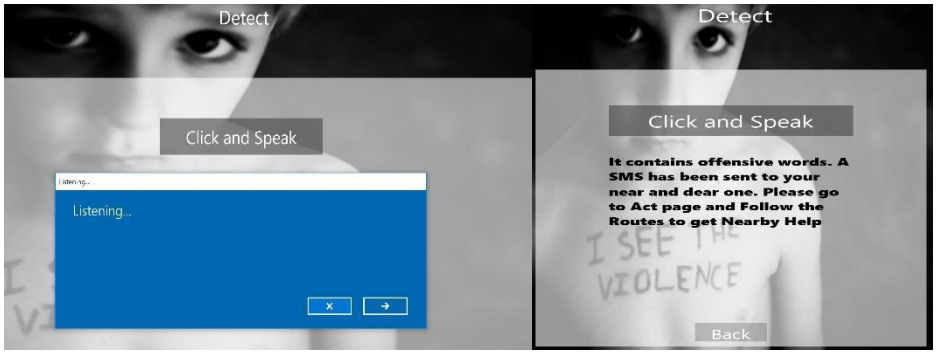
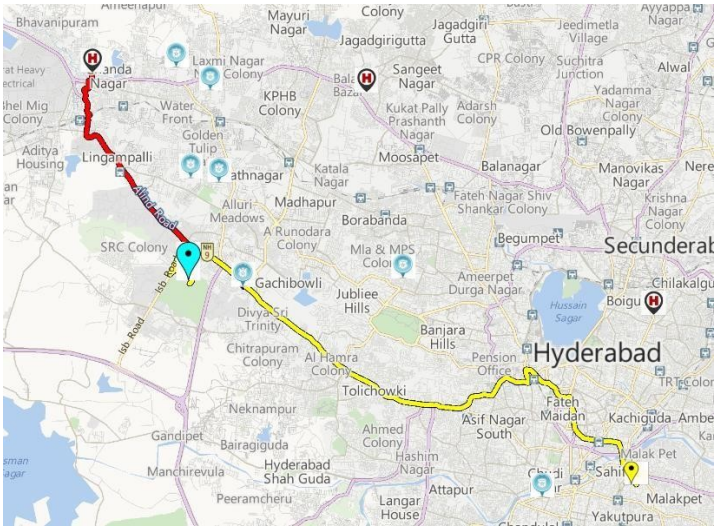
Session Objectives	Domestic Violence is a prevalent problem in the society. All around the world 20 women are victims of domestic violence every Minute. The affected victims are faced with either social stigma from society to express their problems or lack sufficient resources to seek medical help. Some are even unaware of the measures that one can take on being victimized by domestic violence. Our tool firstly detects scenarios of domestic violence in real-time and then proposes on helping such women out by laying out possible solutions. The tool also gives an experience of virtual psychiatrist where it uses machine learning on various medical datasets to learn how a psychiatrist helps a victim of domestic violence. So, it creates a similar imitation of a psychiatrist for a victim and gives possible remedial suggestions, thereby helping those who lack the means or face social stigma to seek psychiatric help.
Description	**Introduction:** Domestic Violence is a big problem around the world today. Although people everywhere are fighting for human rights and equality, there are still hundreds of women facing this problem every day. We propose a solution where we use Microsoft technologies to help such women and make them aware of what possibilities exist for them in case they are a victim of domestic violence. The solution is delivered in the form of a Windows 10 Universal application and makes use of Microsoft technologies like Cortana, Azure ML, Azure Stream Analytics and Bing Maps. The application can be easily installed in the user's phone to detect the violence in real-time and propose immediate actions. The victim can also leverage virtual psychiatrist as a means to heal the problem. To come up with a solution for this problem we came up with two major actions items to help the victims **DETECT and ACT**: **1. DETECT**: This is the first phase of the solution. In this phase, it detects any kind of verbal violence that takes place around the victim. Verbal form of violence includes usage of offensive and inappropriate words at a very high decibel level. The speech to text is done through Cortana Analytics Speech-to-text API and the Decibel level detection is done in real-time through Azure Stream Analytics.

Words of the recorded speech are represented as word 256 dimensional embeddings and then an LSTM (Long Short Term Memory) neural network was used for the binary classification task (domestic violence or not domestic violence). A simple regression model was also trained based on the decibel level. An ensemble of the above two models was used to predict if domestic violence is happening or not.

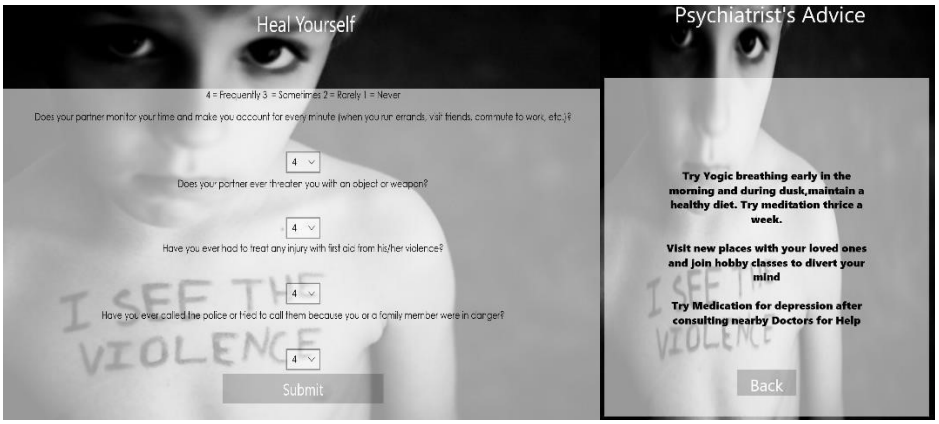
The data used for training was acquired from movie subtitles and manually labelling them.



2. **ACT:** In this step, the app suggests suitable measures to the victim of domestic violence for immediate help. The first measure is by sending a SMS to the victim's close group of family (the mobile numbers are preset by the user). Secondly, Bing map opens up where it detects user's current location and locates nearby Hospitals, NGOs and Police Stations to which the victim can approach and seek help.



Heal: This part of the tool is called “Virtual Psychiatrist” that targets victims who cannot seek psychiatric help due to some reason - monetary or social stigma. This uses a machine learning model that is trained using data of medical records of victims affected by domestic violence who have taken psychiatric help in the past and the solutions suggested to them by the psychiatrist. Support Vector Machine is used for classification. After the model has been trained on the past medical records, the current user’s mental assessment is done through a quiz. According to the user’s answers, an estimation is done on how badly the victim is affected by domestic violence. Based on this level, probable solutions are posed in front of the user as suggested by the trained ML Model. Thus, the customer can seek medical help from the comfort of her home. This part of the tool is still in its initial stage.



Conclusion: This application is an initiative to curb domestic violence and help women using three main techniques. Firstly, it detects scenarios of domestic violence in realtime. Secondly, it acts and suggests immediate counter measures by providing locations of nearby places such as hospitals, police station etc. where the victim can seek help. Thirdly, for long-term remedy, it provides a healing solution through a Virtual Psychiatrist which gives an imitation of a real psychiatrist and suggests the person measures to counter the effects of violence in everyday life.