# PROJECT PROPOSAL

## PROJECT TITLE: **SORE VISION**

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## PROJECT GOAL AND OBJECTIVES

The goal of “Sore Vision” is to provide an easy way for users to perform self-examinations of mouth sores using their Android phone. While it is an understatement that mouth sores do create extreme discomfort and pain for the person, that is not the worst part. One variety of mouth sore, referred to as the “**cold sore**” is highly contagious and an infected person can easily pass on the infection to another person just through skin to skin contact. The other variety of mouth sore, referred to as a “**canker sore**” is also painful but luckily is not contagious. The objective of the “Sore Vision” app is to provide immediate feedback to the user on the kind of mouth sore that he/she is battling when presented with an image of the same. Sore Vision uses deep learning to distinguish a cold sore from a canker sore.

## MOTIVATION

Although mouth sores are a common occurrence in people of all ages including kids in many parts of the world, many people do not clearly understand the risks associated with their condition. While a visit to a dentist or a doctor can help identify the condition accurately, at times this might not be feasible or accessible. The motivation for “**Sore vision**” is to put a simple tool in the hands of every person to help identify his/her mouth sore accurately so that they can take the necessary precautions to ensure that they are not passing on their infection.

## SIGNIFICANCE/UNIQUENESS

Per Gartner, Android has the biggest market share of any platform with a market penetration of 86.2% as of August 2016. Developing this app for the Android platform provides the best possible reach. Currently, the google play store has apps that identify skin conditions such as melanoma but there is nothing to identify mouth sores. Providing a tool like this is of great significance as it aids in controlling the spread of the herpes simplex virus type 1 (HSV-1) from person to person.

## SYSTEM FEATURES

* A downloadable Android app that needs access to the phone’s camera to capture an image of the mouth sore
* A folder of several hundred images of cold sores and canker sores
* A way to assign labels to the images and input the images and labels into the system
* Use a training algorithm to train the system to detect one of two classes (cold and canker)
* Analyze and classify the captured image into the best possible class based on prior learning
* Provide the user feedback on necessary action based on the classification(diagnosis)

## RELATED WORK

* Classification of Dermoscopy Patterns Using Deep Convolutional Neural Networks by Sergey Demyanov
* Dermatologist-level classification of skin cancer with deep neural networks
* First FDA Approval for Clinical Cloud-Based Deep Learning In Healthcare

## BIBLIOGRAPHY

<http://www.webmd.com/skin-problems-and-treatments/tc/cold-sores-topic-overview>

<http://www.webmd.com/oral-health/tc/canker-sores-topic-overview#1>

<http://www.gartner.com/newsroom/id/3415117>

<http://www.orajel.com/en/Resource-Center/Mouth-and-Canker-Sore-Pain-Relief/Canker-sore-vs-Cold-sore>

<http://www.demyanov.net/>

<http://www.nature.com/nature/journal/vaop/ncurrent/full/nature21056.html>

<http://www.forbes.com/sites/bernardmarr/2017/01/20/first-fda-approval-for-clinical-cloud-based-deep-learning-in-healthcare/#697cd35546e6>