Project SoreVision™

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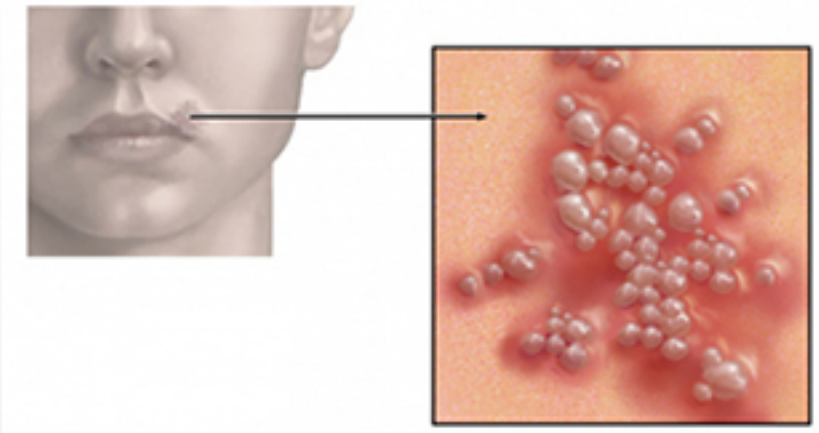
PROBLEM STATEMENT

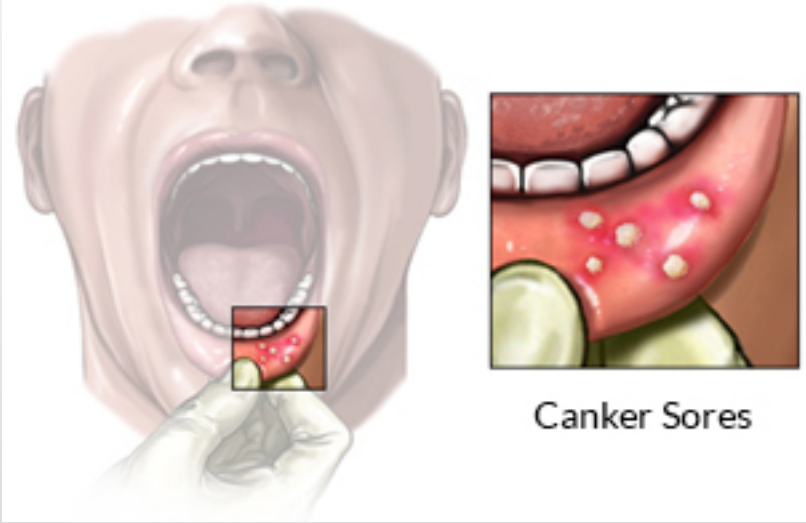
Mouth Sores are quite a common occurring and can show up inside the mouth, on the gums, on or around the lips, or totally outside of the mouth.

Most people do not realize that mouth sores come in two varieties.

One variety of mouth sore, referred to as the "**cold sore**" is highly contagious while the other variety of mouth sore, referred to as a "**canker sore**" is luckily not contagious.



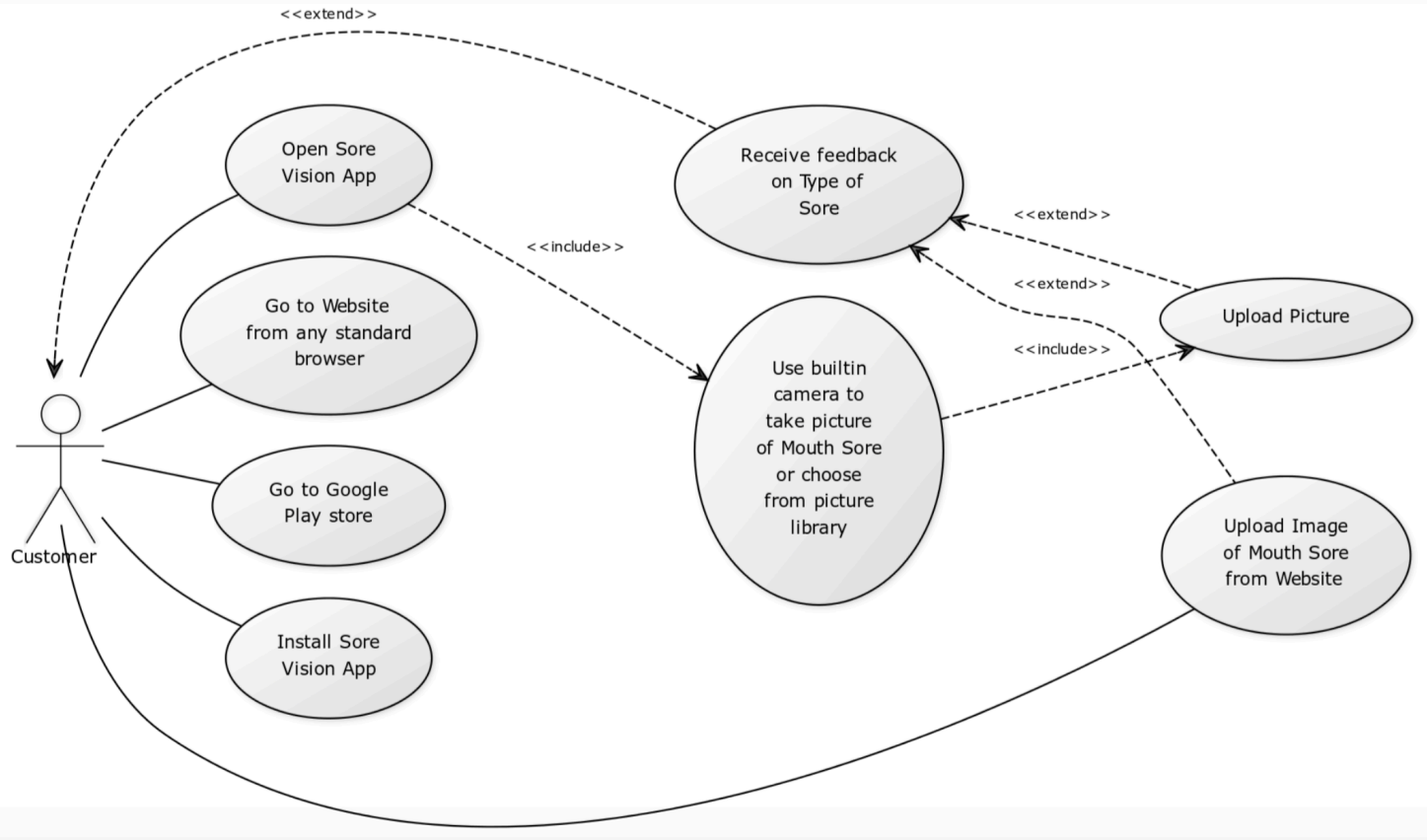
Cold Sores



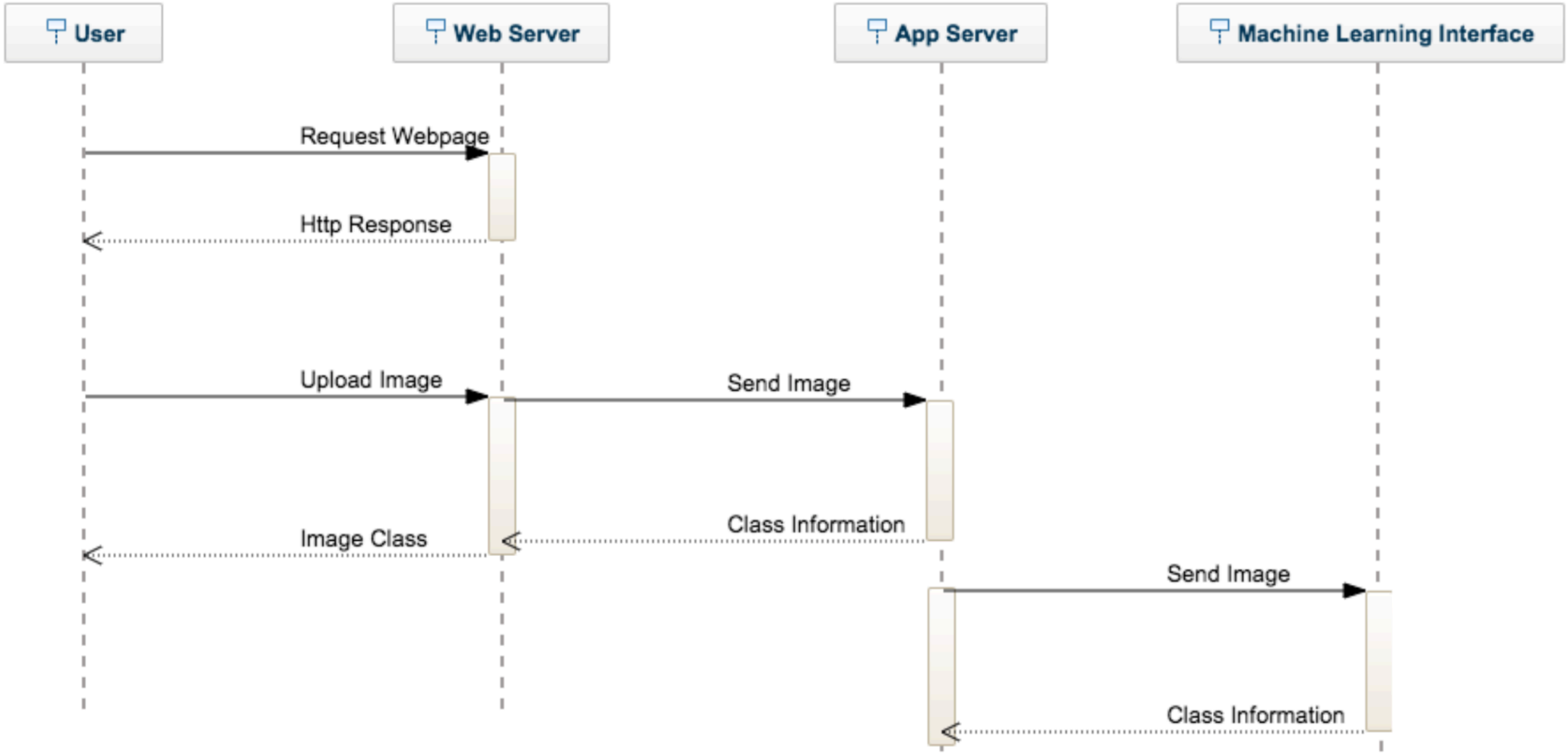
Canker Sores

OUR SOLUTION – SORE VISION™

- "**Sore Vision**" is an HTML5 mobile responsive web app that can aid a person in identifying the kind of mouth sore.
- The person simply takes a picture and presents it to Sore Vision.
- Sore Vision uses deep learning to identify, classify and provide immediate feedback with a certain degree of confidence.

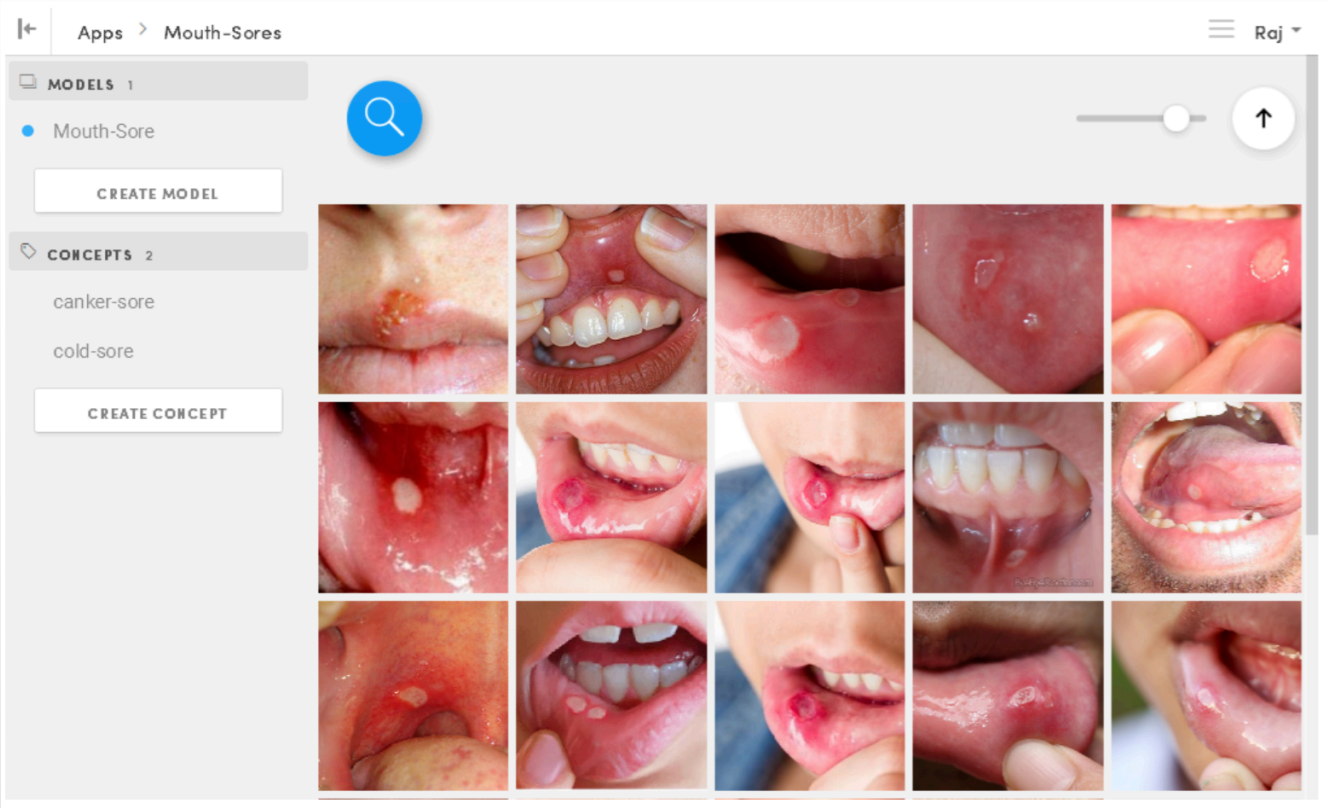


Application Architecture



Technical Approach

- Web UI using HTML5 and JQuery
- Java based and Python based Simple HTTP Servers
- Clarifai API
- Retraining last layer of Inception Model
- Machine Learning (Spark Mllib)
- 75 training images from Google Images



Results

- The Test data set consisted of 6 images that were totally new and the models had no prior exposure to these images
- Test data was classified by three different means
  - A Human dentist
  - Clarifai API
  - Retrained Inception Model
- Clarifai performed the best, followed by Retrained Inception.
- Spark Mllib performed the worst and is not included in the final results because of sub par performance

Image	Dentist	Inception	Clarifai
1	Cold – 100%	Cold – 89.88%	Cold – 86.59%
2	Canker – 100%	Cold – 72.73%	Canker – 77.25%
3	Cold – 100%	Cold – 99.37%	Cold – 94.79%
4	Cold – 100%	Canker – 59.01%	Cold – 93.37%
5	Cold – 100%	Cold – 95.52%	Cold – 93.73%
6	Canker – 100%	Canker – 96.22%	Canker – 92.59%

- This work was done in partial fulfillment of the requirements of CS5542: Big Data Analytics and Apps, CSEE Department, University of Missouri – Kansas City (Spring 2017).
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