CS-460-Project Proposal

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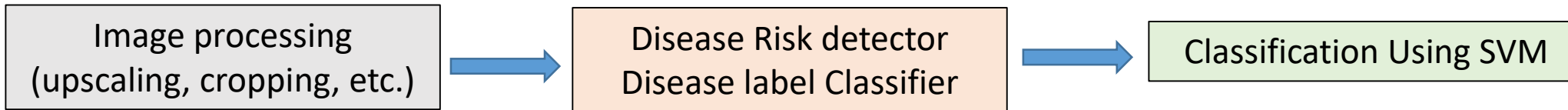## Project Title: Detection of Retinal Disease

Idea/ Motivation:
- According to the WHO, World report on vision 2019, the number of visually impaired people worldwide is estimated to be 2.2 billion, of whom at least 1 billion have a vision impairment that could have been prevented or is yet to be addressed.
- Early detection and diagnosis of ocular pathologies would enable forestall of visual impairment.

Relevant papers:
- Multi-disease detection in retinal imaging based on ensembling heterogeneous deep learning models by Dominik Müller et. al. (Link)
- Suthaharan, S. (2016). Support Vector Machine. In: Machine Learning Models and Algorithms for Big Data Classification. Integrated Series in Information Systems, vol 36. Springer, Boston, MA. (Link)

Baseline Implementation:

| Image processing (upscaling, cropping, etc.) | → | Disease Risk detector Disease label Classifier | → | Classification Using SVM |

Target By Mid Semester: To build successful image processing method, achieve a basic baseline implementation with optimized disease risk detector and the disease label classifier.

Expected results: To achieve similar accuracy of detection using SVM model and get a computationally less expensive model, as SVM might perform better using kernel space methods.

References:
- Kaggle
- https://paperswithcode.com/dataset/retinal-fundus-multidisease-image-dataset
- https://www.geeksforgeeks.org/differentiate-between-support-vector-machine-and-logistic-regression/