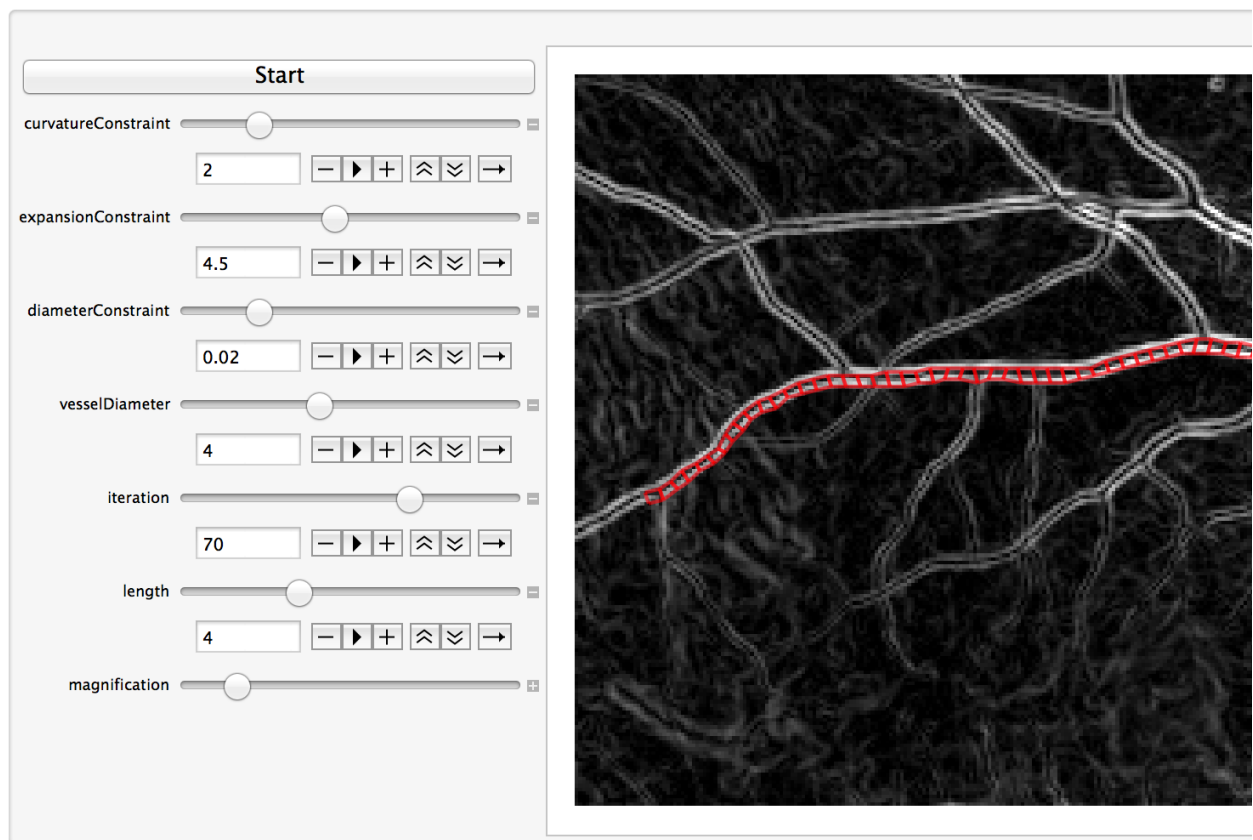


## Vessel Segmentation of Retinal Fundus Images

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### Project description

Early detection of ophthalmic diseases is important for patients to optimize their treatment benefits. Retinal fundus photography is one of the most commonly adopted medical imagings for ophthalmologists to locate abnormality of vessel structure as a major indicator of various diseases. However, existing methods usually utilize filters on global fundus image to segment retinal vasculature as a whole, which will have insufficient information about local vessel network. Therefore, our project aims at developing a novel machine-learning algorithm to separate and rebuild a vessel starting from specific points generated by user interface.



## Summary of results and conclusions

The user needs to select two points at each side of one vessel (red dots), and a third position to indicate an initial angle (blue dot). By changing the constraint parameters on curvature, expansion, and diameter, our model can trace the vessel without the disturbance of other branching vessels.

## Future Directions

Ideally, the constraint parameters can be optimized automatically. It would be more useful for ophthalmologists if future project can specify branching network, and compute measurements for targeted pathologies with high accuracy. The results of future algorithm will be compared with standard references marked by trained clinicians. We can possibly apply the same technique to 3D OCT image to reconstruct 3D vessel structure.