

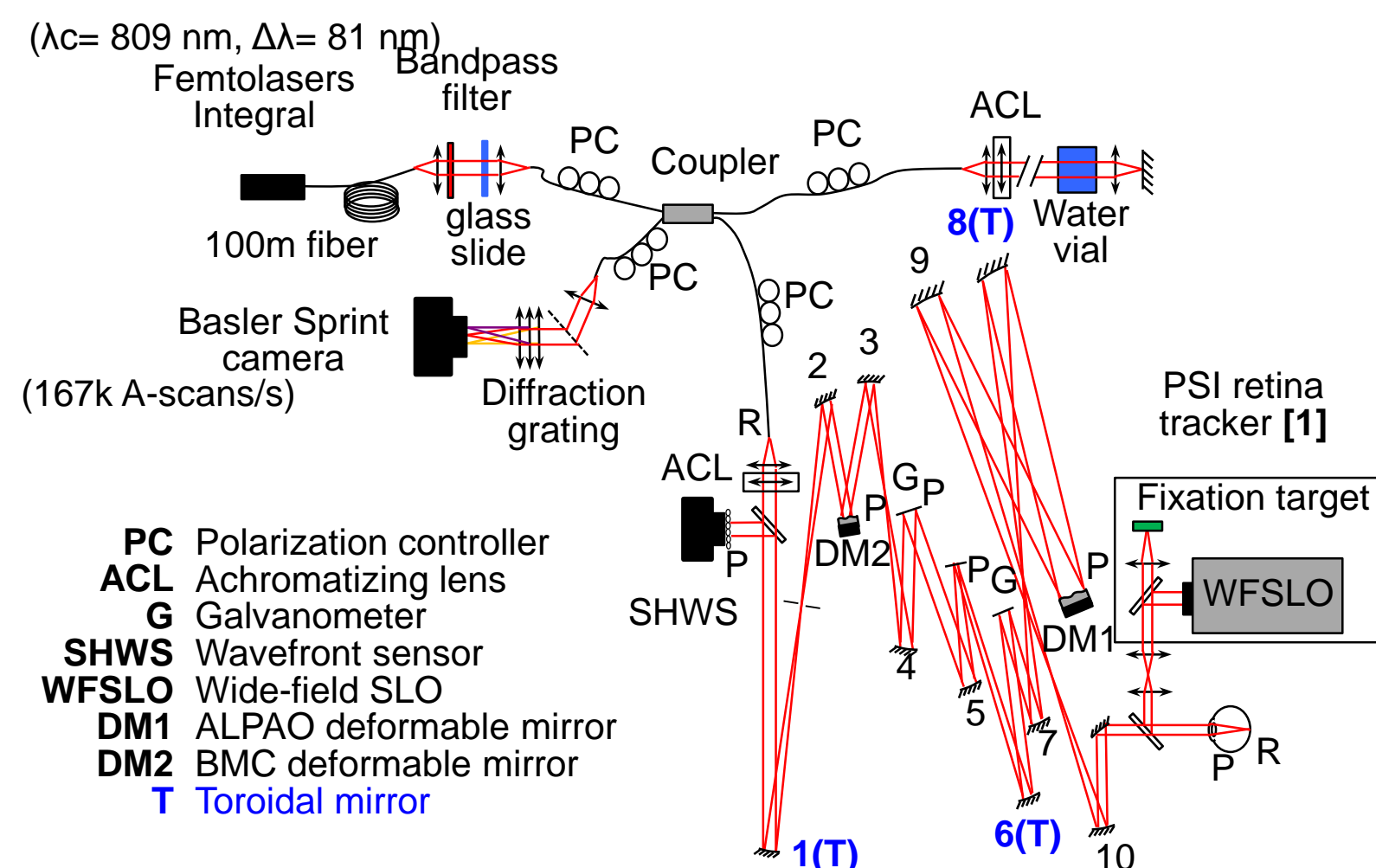
Ayoub Lassoued¹
¹Graduate Program in Vision Science, ²School of Optometry, Indiana University, Bloomington, IN

INTRODUCTION

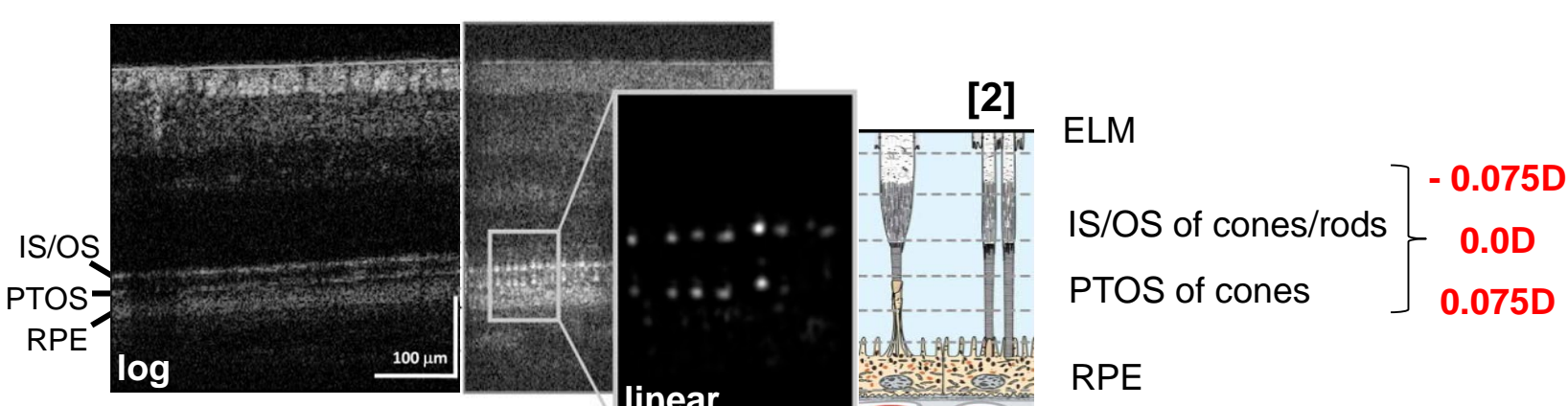
Recent technological advances in adaptive optics (AO) and high-resolution ophthalmoscopy have resulted in sharper images of the cellular retina than previously possible. AO-OCT is a promising diagnostic tool in eye clinics. In this study, we propose to :

- (1) Diagnostic a diseased retina using computer-vision techniques applied on AO-OCT scans from both healthy subjects and subjects with Retinitis Pigmentosa.

INDIANA 2nd GENERATION AO-OCT SYSTEM



METHODS – PHOTORECEPTOR IMAGING



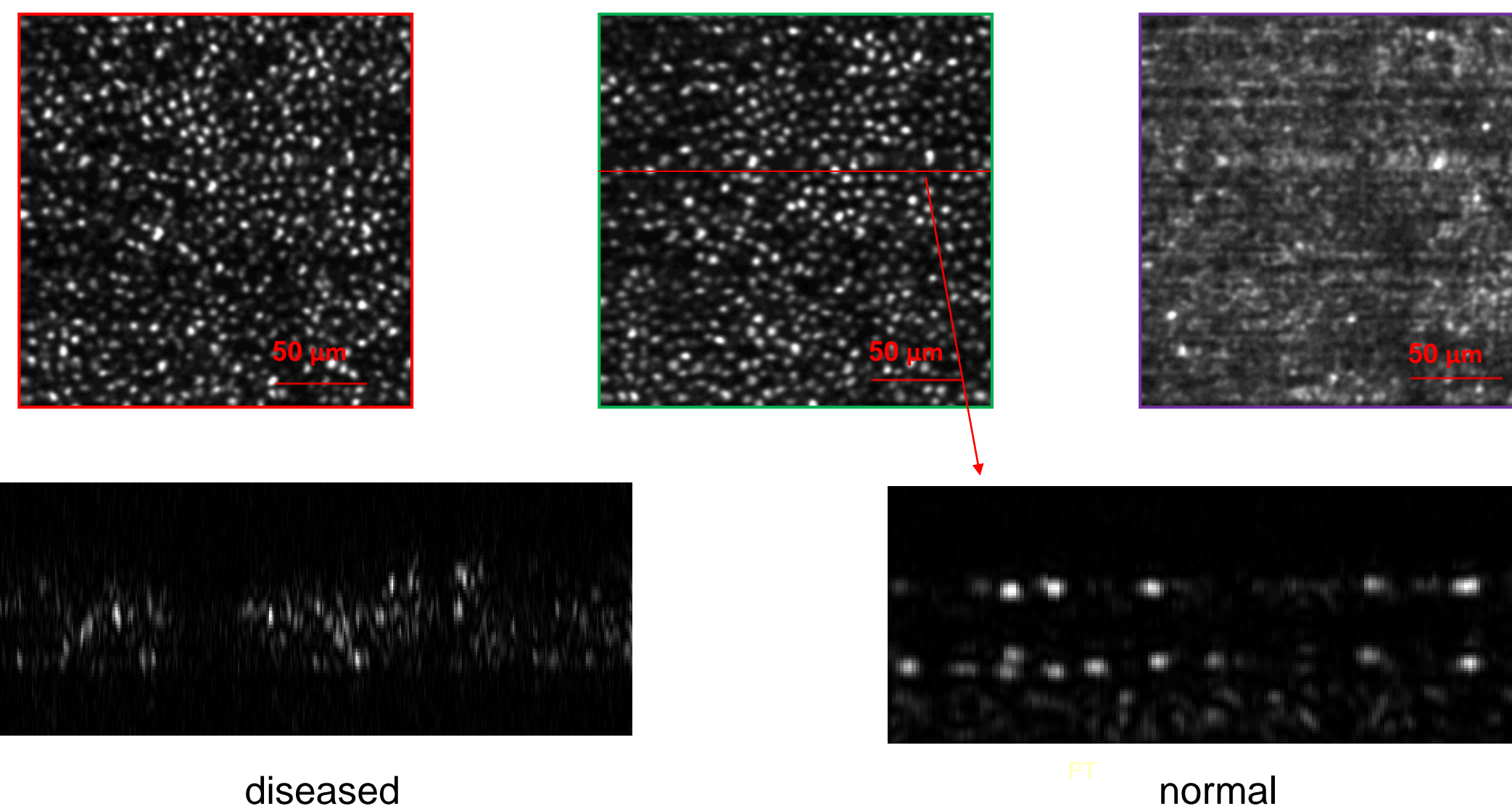
Data collection:

Data analysis:

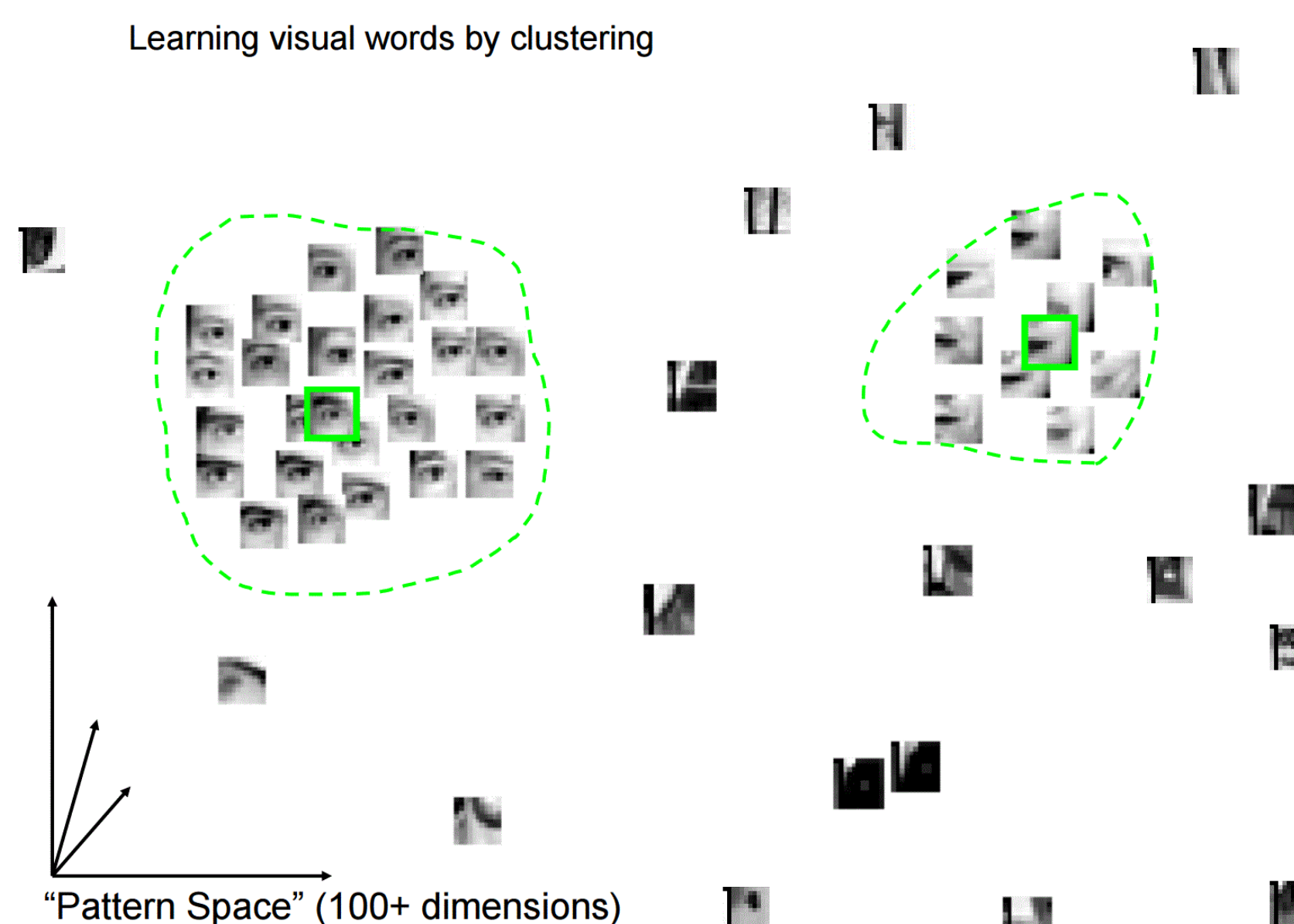
- 1 normal subject (OD) and 2 unhealthy subjects (OD).
- 0.5°x0.5°, 0.9°x0.9°, 1.5°x1.5° volume videos
- - acquire two thousand scans.

- Extract features such as SIFT and cluster them.
- Train an SVM on scans from healthy and unhealthy subjects (800 scans).
- Classify test images (650 scans).

PHOTORECEPTOR IMAGING

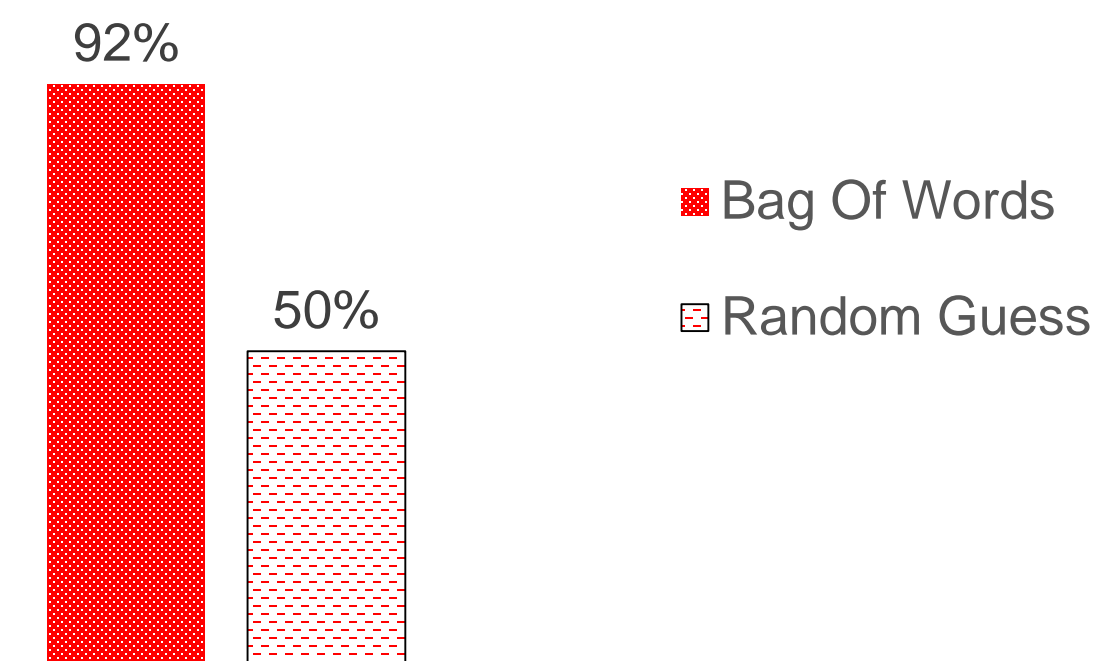


FEATURE EXTRACTION



RESULTS AND DISCUSSION

Classification accuracy



- Our approach is efficient for RP disease, but was not tested for other diseases.
- Possible future application is classify the individual cones.

REFERENCES

- [1] http://www.robots.ox.ac.uk/~az/icvss08_az_bow.pdf
- [2] Spaide, et al., Retina, 31(8), 2011
- [3] Curcio, et al., J. Comp. Neurol. 292(497), 1990
- [4] Dubra, et al., Biomed. Opt. Express, 2(7), 2011.
- [5] <http://stackoverflow.com/questions/7352706/cannot-allocate-an-object-of-type-error>

ACKNOWLEDGEMENT

This work was supported by NEI funding 1R01 EY018339, 5R01 EY014743, and P30 EY019008. The author particularly thanks Shashant Devadiga for providing part of the code used in this work.