

Principal Investigator

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Summary of research:

Retina, Imaging, Machine Learning, Computer Vision

Application Lay Summary:

1a: Retinal imaging in the form of fundus photography and OCT are well-established diagnostic tools for eye diseases such as diabetic retinopathy, glaucoma and age-related macular degeneration. It has also been suggested as a prognostic tool for the severity of systemic disease such as diabetes, stroke, and dementia. Our work centers around using machine learning and computer vision to (1) automate the detection of eye diseases which are currently diagnosed via retinal imaging and (2) identify novel features in retinal imaging that may be predictors or early signs of eye disease as well as systemic disease.

1b: If successful, this work will help improve the detection of eye diseases and potentially other systemic diseases. Automated detection also has the potential of increasing efficiency and reducing costs.

1c: Using labeled fundus and OCT images as the main inputs, we will train computer algorithms to automatically predict image labels using machine learning and computer vision.

1d: We are requesting data from all patients that have had the retinal imaging performed. Per the UK Biobank look-up tool, this consists of 67,711 patients that make up the collection of 68,151 paired colour retinal photographs and optical coherence tomography (OCT) scans.