

1145-54-2677

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Righi. *Macular Degeneration Classification through Topology and Convolutional Neural Networks.*

Macular degeneration is a disease of the retina that affects the macula, the region in the center of the retina responsible for high-resolution, color vision that is possible in good light. The loss of central vision makes it difficult to recognize faces, drive, read, or perform other activities of daily life. The classification of macular degeneration in the retina involves the ability to differentiate between three different types of macular degeneration, drusen, choroidal neovascularization, and diabetic macular edema as well as healthy retina. In this project, we combine methods from computational topology and deep learning to analyze a data set consisting of 83,711 optical coherence tomography (OCT) images of healthy and diseased retinas. In the first stage of this project we have applied convolutional neural networks to this data set. Our goal is to improve upon non-topological based analyses of OCT images. (Received September 25, 2018)