



# Local Retinal Morphology Prior to the Onset of Neovascular AMD: A Topographic Analysis using Machine Learning

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## **Purpose and Motivation**

In patients with intermediate age-related macular degeneration (AMD), risk of progression to neovascular AMD is highly the **heterogeneous** [1] and variable and the prognostic signs are unclear.

We utilized machine learning to predict at which topographical location neovascular AMD lesions develop.



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## Materials and Methods

OCT scans (512x128x1024 voxels, Cirrus) of fellow eyes of patients with choroidal neovascularization (CNV) undergoing regular monthly imaging were processed and registered at the time of advanced AMD onset as well as 1, 3, 6, 9 and 12 months prior.

**Patients**: 86 eyes with PED, and 27 eyes without PED

### Image Computing and Analysis

Graph-based **Retinal Layer segmentation** [2] Deep learning based IRF/SRF Fluid segmentation [3] Deep learning based Hyperreflective Foci (HRF) segmentation [4]





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Identification of neovascular AMD local onset Type I: **PED area** used to denote the onset location Type II: SRF area *should* mark the onset. But SRF spill can be extensive Type III: **IRF area** used to denote the onset location A total of 20 different topographic 2D feature maps were computed and rescaled to a 16x16 grid. A machine learning classifier (random forest) was trained to predict the local onset of neovascular AMD for each grid cell.



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### References

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## Results

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