

# Deep learning model detects diabetic eye diseases accurately

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Credit: Aalto University

According to the research findings published in *Scientific Reports*, the deep learning model detects the severity grade of diabetic retinopathy and macular edema accurately. Diabetic retinopathy is one of the most common comorbidities of diabetes that, if untreated, may lead to severe vision loss. Macular edema refers to swelling under a specific part of the retina caused by diabetic retinopathy.

The [deep learning model](#) identified referable [diabetic retinopathy](#) comparably or better than presented in previous studies, although only a very small data set was used for its training. The model turned out to be more accurate in identifying diseases when the training images of patients' fundus were of high quality and resolution.

Results suggest that such deep learning system could increase the cost-effectiveness of screening and diagnosis and that the system could be applied to clinical examinations requiring finer grading.

Currently, retinal imaging is the most widely used method for screening and detecting retinopathy, and [medical experts](#) evaluate the severity and the degree of retinopathy in people with diabetes based on the fundus or retinal images of the patient's eyes.

As diabetes is a globally prevalent disease and the number of patients with diabetes is rapidly increasing, also the number of retinal images will increase, which in turn introduces a large labor-intensive burden on the medical experts as well as cost to the healthcare. An automated system that would either assist medical experts or work as a full diagnostic tool could alleviate the situation.

**More information:** Jaakko Sahlsten et al. Deep Learning Fundus Image Analysis for Diabetic Retinopathy and Macular Edema Grading, *Scientific Reports* (2019). [DOI: 10.1038/s41598-019-47181-w](#)

Provided by Aalto University

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