Diabetic retinopathy grader ("DRG")

What's new: Using deep learning techniques we have implemented a platform to examine and classify fundus images according to the various degrees of severity of diabetic retinopathy (DR).

Key insights: DRG is designed to mimic the eye's fundus examination in an unsupervised tele-ophthalmology setting. It takes a patient's color fundus images as input, returning the ranked list of probabilities across the five severity degrees detailed in the International Clinical Diabetic Retinopathy Disease Severity Scale.

How it works: Users capture color fundus images from patients with suspected DR using an ophthalmoscope (or, a cloud-hosted tool). An encoding algorithm within Topazium's cloud feeds it into a non-linear algorithmic framework which predicts the probability surface across each particular severity degree.

ICDRDS scale
No DR: 0.04
NP Mild: <0.01
NP Moderate: 0.79
NP Severe: 0.02
Proliferative DR: 0.13

Results: DRG classifies suspected DR into the five degrees of the ICDRDS scale with similar accuracy as reported for well-trained ophthalmologists.

Why it matters: DR can cause permanent blindness if left undiagnosed and untreated. Clinicians can identify DR by ophthalmoscopy. While this approach is effective, it requires a high degree of expertise. Topazium's framework currently classifies ocular fundus images and can assist non-trained ophthalmologists and general practitioners delivering real-time inferences, which would accelerate treatment's times across remote regions. It can also be used to accelerate the triage for priority interpretation in tele-ophthalmology platforms.