Study	Deep-learning Approach	Objective/Application	Image Acquisition Type
Gao et al.[Gao]	A custom CNN inspired by the work of Socher et al., to extract features, which are fed into a recursive NN for classification (grading) of cataract	To grade of the severity level of nuclear cataract in pediatric patients	Cross-sectional slit lamp images from ACHIKO-NC dataset
Liu et al.[Liu]	A CNN inspired by AlexNet to grade cataract in pediatric images	To localize and quantify pediatric cataracts in terms of area, density, and location using a DL solution	Slit lamp images
Asoaka et al.	50+ features based on visual-field tests fed to a NN processed by stacked-denoising autoencoders to classify healthy eyes from those with open-angle glaucoma	To identify pre-perimetric glaucomatous visual fields using NNs	Humphrey field analyzer 30-2 program.
Chen et al.	A custom CNN for classification of optic-disk images into those with or without glaucoma	To assess the accuracy of a DL for automatic glaucoma diagnosis	Optic nerve images from ORIGA and SCES datasets. Region of interest identified and then resized to 256 x 256 pixels.

Muhammad et al.	A pretrained CNN, AlexNet, used to extract features, which were then employed to classify patients into those with or without glaucoma via a random forest classifier	To determine if a hybrid DL method can distinguish glaucoma suspects from mild glaucoma based on their OCT scans	Wide-field (9x12mm) swept-source OCT.
Burlina et. al.	A custom CNN based on AlexNet to classify images into 4 stages of severity of AMD	To differentiate between without/early AMD (0) vs. moderate to advance AMD (1)	From the AREDS data, analog photographs over 130.000
Fang et al.	A custom CNN coupled with graph-search algorithm for segmentation of the nine retinal layers in nonexudative OCT scans of AMD patients	To segment the boundaries of the retinal layers in OCT scans, whose thickness may indicate the presence of AMD	2915 b-scans from 20 patients with Dry AMD
Abbas et al.	A 3-layer NN with several image-features extracted and fed to them. *It should be noted that it is debatable whether this work is truly employing a DL solution*	Classification of image into various DR severity levels. It is unclear whether normal DR is meant to represent negative cases (incorrect wording), or that the authors are only concerned in severity levels of DR and not normal cases.	750 from different sources, 150 for each level

Abramoff et al.	A custom DL solution based on the AlexNet for segmentation of various lesions associated with DR to perform staging of an image into normal vs. all other severity stages of DR, including ME	Compare performance of DL solution to a prior algorithm for automated detection of referable diabetic retinopathy	45° fundus photo centered on the fovea (with and without mydriatic (Messidor-2 database)
Gargeya et al.	A custom CNN solution based on the VGG/AlexNet designs with heat-map visualization of detected features	To classify an image into without-DR vs. with-DR (any stage) i.e. triaging	Pictures from varying camera models, brightness, and contrasts balanced
van Grinsven et al.	A custom CNN solution coupled with a dynamic-training scheme	To compare the results of a dynamic-training scheme against a standard-training method in detection (segmentation) of hemorrhages	Fundus photos from Kaggle database
Gulshan et al.	The GoogleNet-Inception network	To develop and validate the grading of images into normal vs referable DR or referable DME, or both	Training: EyePACS database. Validation: EyePACS database and Messidor-2 data set. 45° fundus photos with different cameras with and without pupil dilation.

Pretnasic and Loncaric	A custom CNN solution for segmentation of exudates	To determine if CNNs can effectively detect exudates	DRiDB database of color fundus images
Shan and Li	A DL solution based on stacked-sparse autoencoders (not CNN) for segmentation of microaneurysms (MAs)	To assess the performance of a DL strategy in identifications of MAs	Fundus photos from DIARETDB (uses regions with and without)
Takahashi et al.	A modified GoogLeNet solution for staging of retinal images into 3 categories of DR	To determine Davis staging (No/Simple/PreProl/Prol) and the prognosis in terms of treatment: no tx, tx during the current visit, or tx next visit	9939 post pole nonmydriatic 45* of 4 fields shrunken to (1272x1272p)
Lee et al.	A modified version of the U-Net autoencoder architecture to segment intraretinal fluid (IRF) in OCT scans	Validate the accuracy of a DL solution for segmentation of IRF in OCT scans	1289 Manually segmented OCT's
Choi et al.	Retrained versions of the VGG19 network as well as AlexNet solutions to classify retinal images into 10 different classes of pathologies	To determine the capability of a DL solution in classifying 10 different retinal pathologies	Fundus photographs from STARE database

Ohsugi et al.	A custom CNN for diagnosis of rhegmatogenous retinal detachment (RRD) in ultra-wide-field retinal images	To assess the performance of a DL solution in classification of ultra-wide-field images into normal vs. RRD	420 NON RD vs 411 with RD - Pictures reduced to 96x96 pix
Prahs et al.	The GoogLeNet-Inception design to classify OCT scans into injected (treated) vs. noninjected (untreated) classes	To identify whether an image belongs to a retina that has been treated with anti-VEGF or not	OCT Radial scan x 6, final resolution of 256x256 pixels
Roy et al.	A custom CNN called ReLayNet for Segmentation of retinal layers as well as IRF in OCT scans	To segment the 7 retinal layers, plus any IRF in OCT scans of DME patients	OCT from 10 patients with DME
Xu et al.	A dual-stage custom CNN for segmentation of pigment epithelium detachment (PED) in OCT scans	To determine the accuracy of a DL solution in automatic segmentation of PED in polypoidal choroidal vasculopathy (PCV) patients	Resized OCT's to 384x384 pixels
Li et al.	A custom CNN coupled with gray-scale thresholding for segmentation of retinal vasculature	To assess the performance of a DL solution in segmentation of retinal vessels	Retinal images from DRIVE dataset

Maji et al.	An ensemble of custom CNNs for segmentation of retinal vasculature	To assess the performance of a DL solution in segmentation of retinal vessels	Retinal images from DRIVE database