Detection of Diabetic Eye Diseases

MATLAB EXPO 2017

by:

Phani Kiran
Signal Processing Engineer
Statistics of Diabetes

Excerpt from International Diabetes Federation Diabetes Atlas (www.idf.org)
Eye conditions that effect people with Diabetes

- Diabetic retinopathy,
- Diabetic macular edema (DME),
- Cataract
- Glaucoma.

- Out of the above mentioned diseases, **Diabetic Retinopathy** (DR) is one of the serious eye conditions which occur in diabetic patients with long diabetic history.
- DR is the process of deposition of blood over the retina which will eventually lead to serious vision problems.
Difference between Diabetic eye diseases

- Healthy eyes
- Glaucoma
- Cataract

Normal fundus

Fundus with DR
Problem Statement

- As people with diabetes are increasing, it is difficult to get constant attention of ophthalmologists.

Solution

- Automatic detection with accuracy is necessary.
Parameters to be analysed to confirm DR.

- Tortuosity of blood vessels
- Microaneurysms
- Hemmorhage
- Lesions
- Exudates
Algorithm

• fundus Image has to be loaded

• Detection of the above parameters mentioned earlier, has to be done based on their occurrence.

• Develop a ranking factor using machine learning techniques to determine the seriousness of the disease.
Parameter to be extracted are taken from these images

- Normal Fundus images
- Image used to extract nerve related parameters
- Image used to extract microaneurysms, exudates

The above images are extracted using Image processing techniques, the parameters obtained are used in machine learning techniques.
Conclusion

• The parameters thus obtained are used to train the ML algorithms which will be learning to classify an image as Diabetic Retinopathy or not.