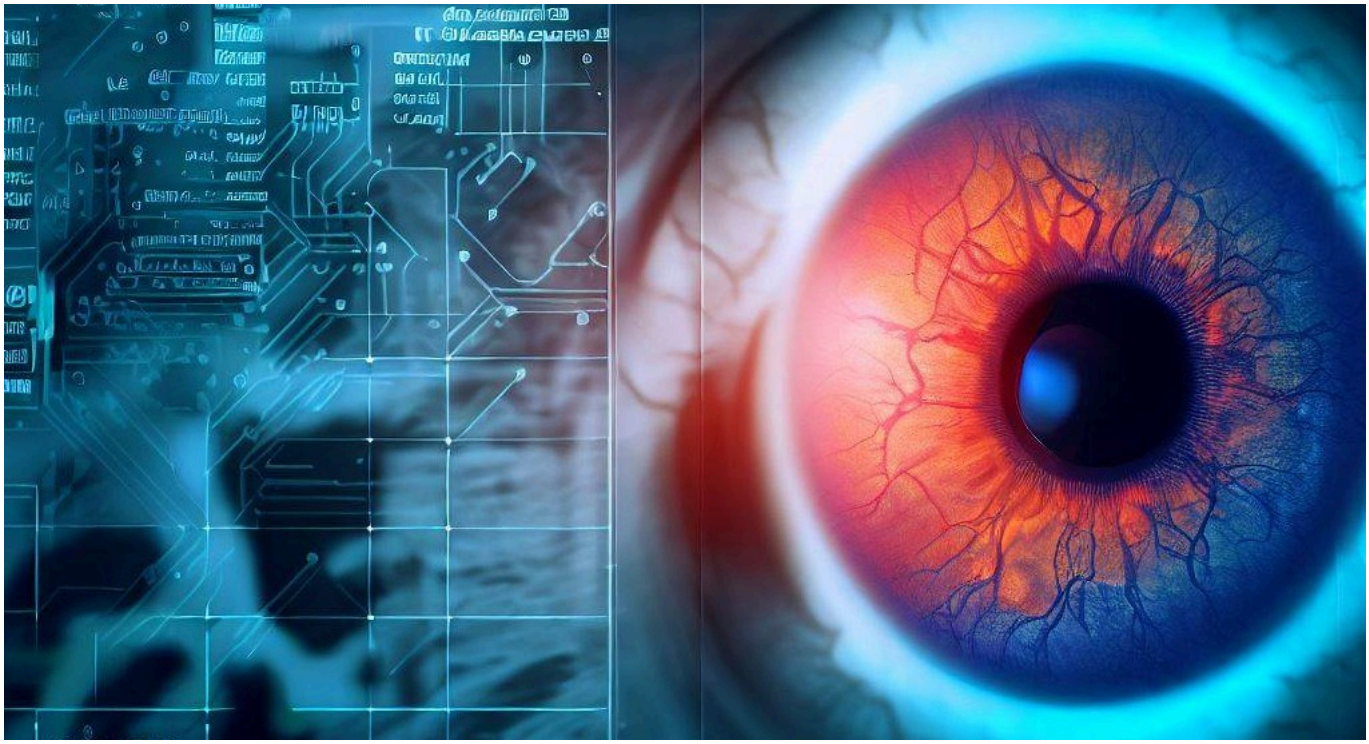
TECH OFFER

Automated Diagnosis Of The Retinal Image (Normal/Abnormal) Using Deep Neural Network



KEY INFORMATION

TECHNOLOGY CATEGORY:
Healthcare - Telehealth, Medical Software & Imaging

TECHNOLOGY READINESS LEVEL (TRL): TRL5
COUNTRY: SINGAPORE
ID NUMBER: TO174893

OVERVIEW

This technology offers an automated diagnostic solution for retinal health based on fundus image and deep learning technology. The network automatically classifies fundus images of age-related macular degeneration (AMD), diabetic retinopathy (DR), glaucoma and normal into abnormal and normal classes. The network also can be run on any computing platform, delivering instant results for clinicians and patients.

TECHNOLOGY FEATURES & SPECIFICATIONS

The developed 10-layered neural network can automatically classify images of age-related macular degeneration (AMD), diabetic retinopathy (DR), and glaucoma as abnormal and illustrations of normal subjects as normal. The input image for the system is of size 180 x 270 pixels. The network uses different-sized kernels to interpret the input fundus image, after that, the feature maps are concatenated for analysis.

The system was developed and tested on a total of 2986 images (collected from various sources). 'ADAM' optimizer was used to train the net and achieved an accuracy of 95.24% on a set of 1492 images. A system and method for automated retinal health screening using the deep learning CNN technique is developed. The system automatically classifies images of age-related macular degeneration (AMD), diabetic retinopathy (DR), and glaucoma as an abnormal class and images of normal subjects as a normal class. The CNN entails three main layers, the convolution, pooling, and fully connected layers, with a series of convolution and max pooling steps to provide an accuracy of 96.31%, sensitivity of 97.96%, and specificity of 92.67%. The developed network is commercially ready to deploy to any computing or mobile device.

POTENTIAL APPLICATIONS

This automated diagnosis solution can be deployed at any clinical facility for the mass screening and routine screening of the fundus.

UNIQUE VALUE PROPOSITION

The benefits of the technology include:

- The diagnosis is fast and reliable.
- Reduce clinician's workload.
- Network is compact (small).
- Readily to be deployed on any computing or mobile device.