# *Ollie* an automatic ophthalmologist assistant

A software tool to detect eye diseases accurately and efficiently using deep learning models


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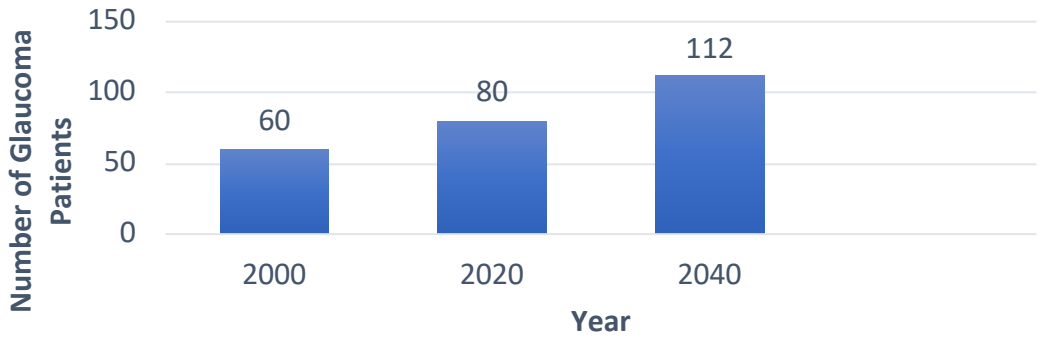
# Problems

## Glaucoma:

leading cause of irreversible blindness

## 112 million

People are estimated to have primary glaucoma globally by 2040, with 10% of them suffering from bilateral blindness. [1]




## $ 1.5 Bn

cost to the U.S. government in terms of Social Security benefits, lost income tax revenues, and health care expenditures

## > 50%

glaucoma patients are unaware of their disease in developed countries. [2]

## ~ 2 weeks

Average time taken for diagnosis after eye scan

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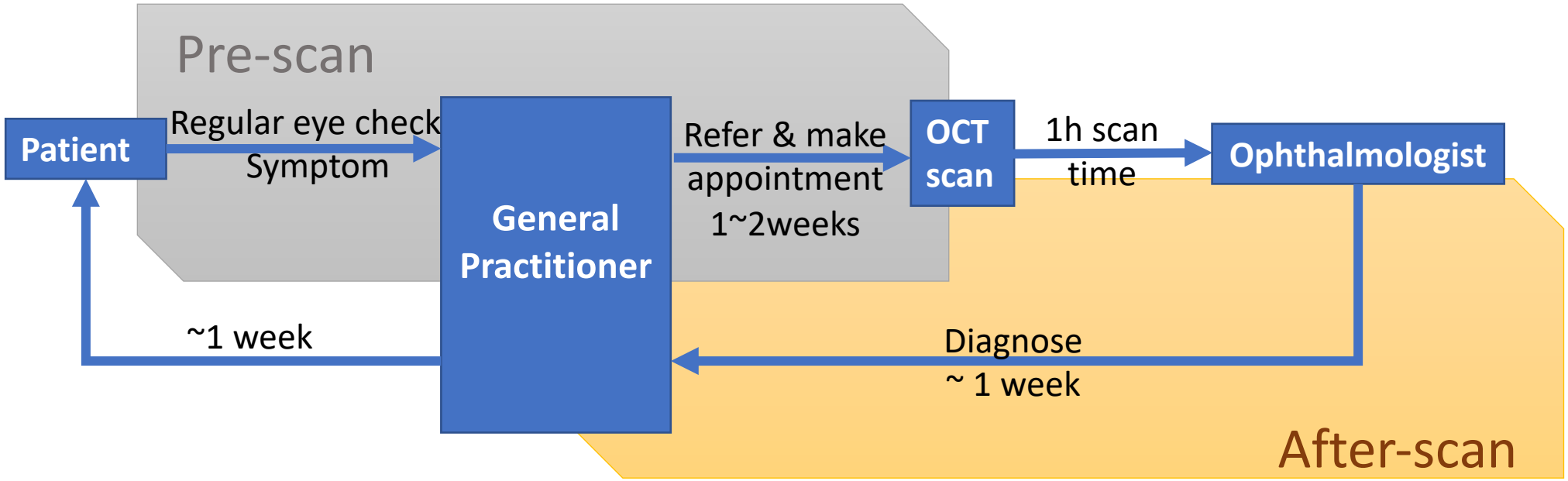
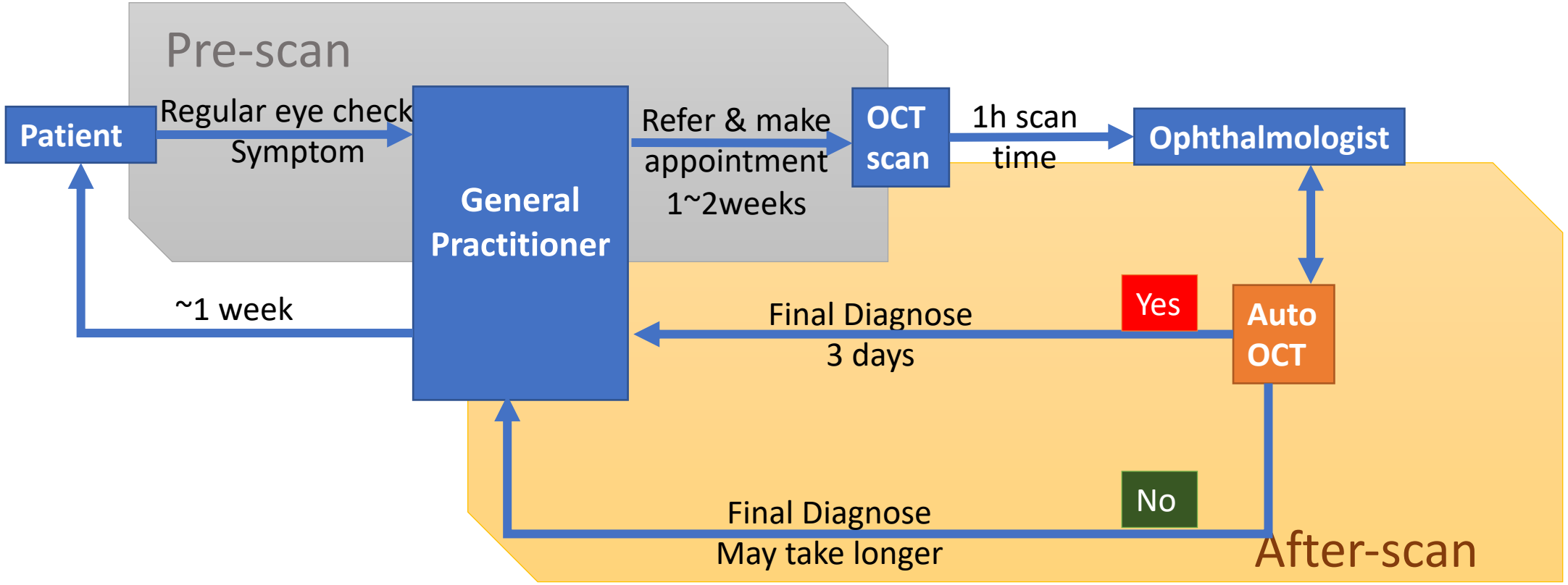
[1] Yaniv Barkana et al. (2014) Global Prevalence of Glaucoma and Projections of Glaucoma Burden through 2040: A Systematic Review and Meta-Analysis
[2] Harry A Quigley (1996) Number of people with glaucoma worldwide

# Diagnosis Routine



# Diagnosis Routine



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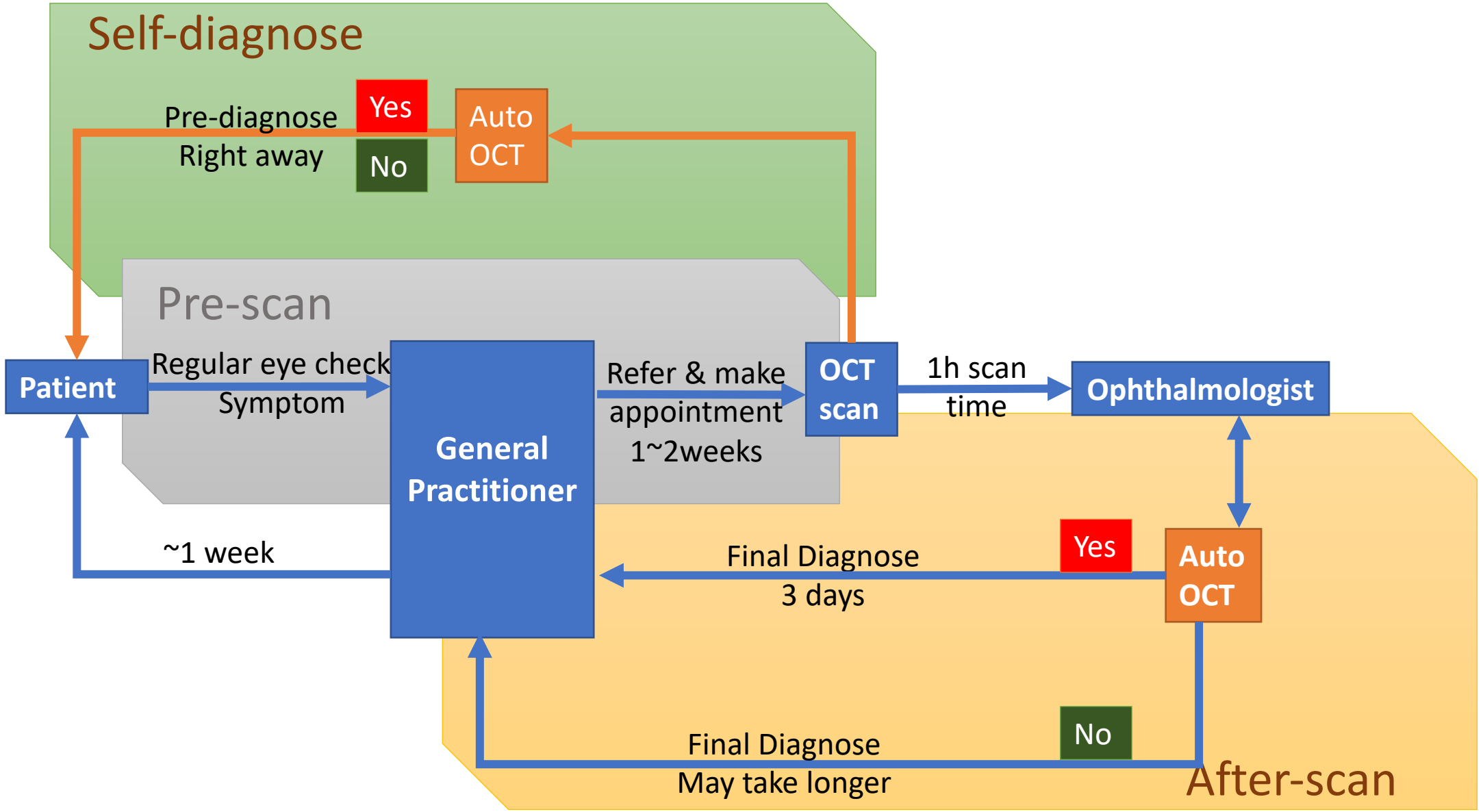

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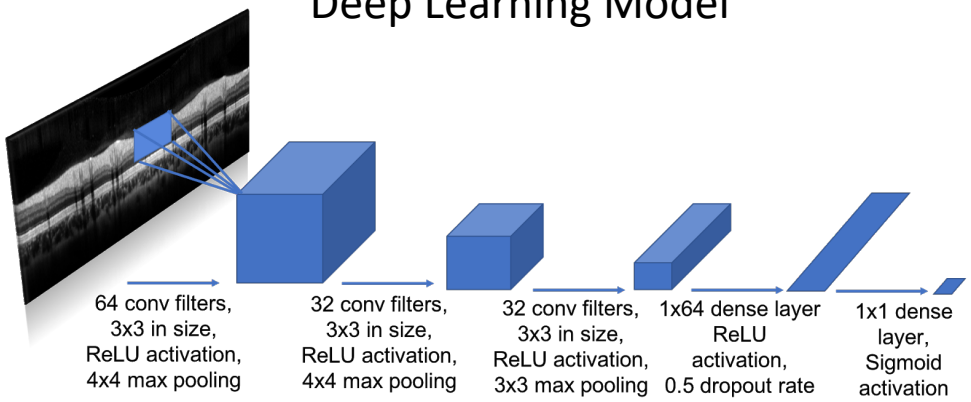
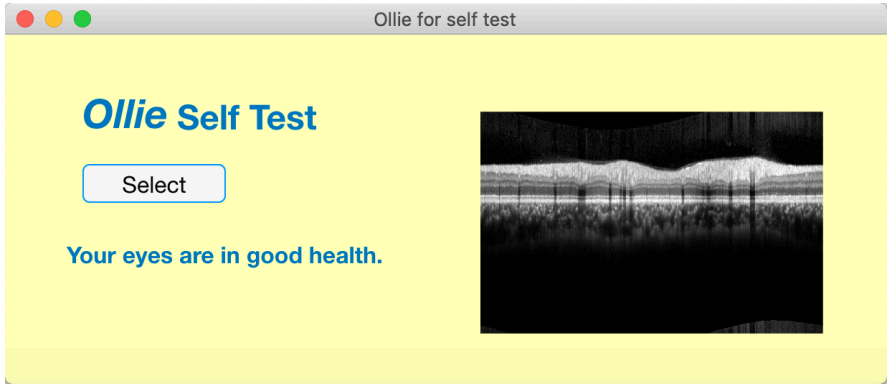
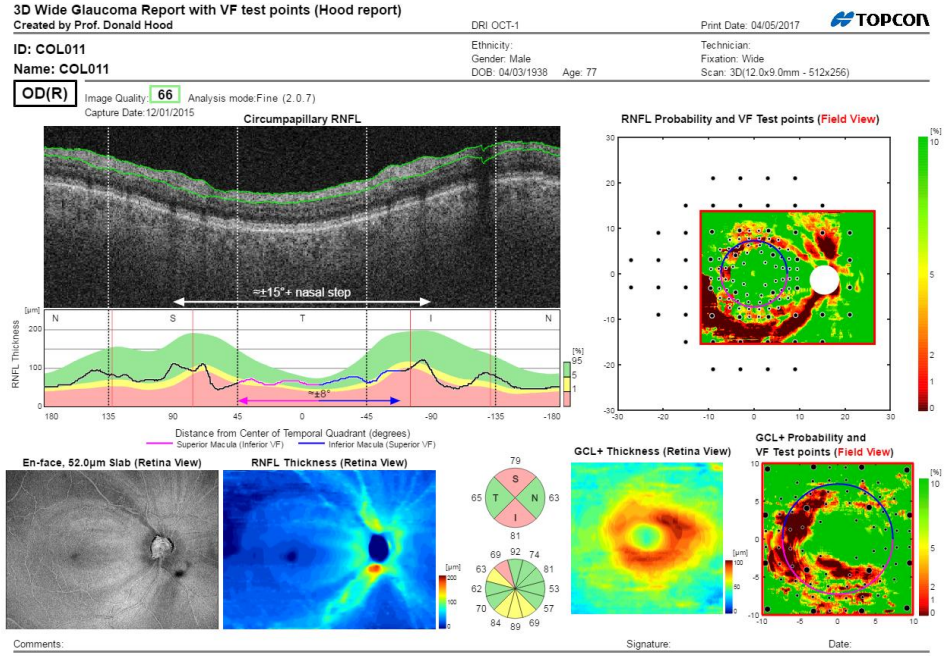
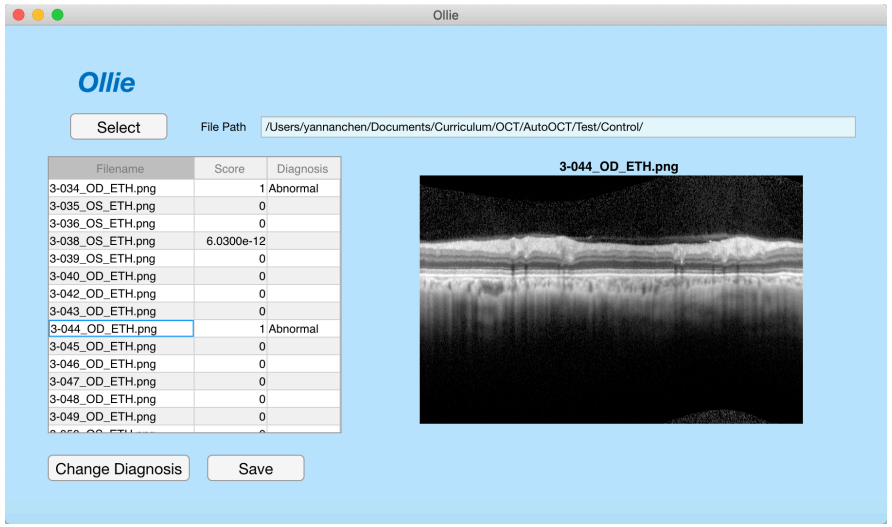
## Deep Learning Model




## Full Report



# Potential market size and impact

| | Direct to patient | Portable diagnosis kits for general practitioners | Ophthalmologist facilities | Device makers (OCT scanners) |
|---|---|---|---|---|
| **Customer Channels** | | | | |
| **Focus area** | • Reduces the time for patients to get a preliminary diagnosis<br>• Independent opinion to decide if they need specialist appointment | • Provided as part of a portable kits with hand-held camera to analyze fundus images<br>• Provides early diagnosis to patients with lack of access to ophthalmologists | • Provides a way to prioritize the patient queues waiting to be diagnosed<br>• Reduces waiting time for patients with potentially high severity | • Device makers can embed the model with OCT scanners as value added service |
| **Monetization Strategy** | Free | Licensing fee with kits | Native application licensed to facilities | Licensed with OCT scanning machines |
| **Total addressable market and impact** | NA<br>Potential ad revenue | • # of general practitioners = 100k<br>• $ per kit = 400<br>• License fee = 10% of kit fee<br>• Market size = $4Mn | • # of visits = 10Mn<br>• % involving image diagnosis = 50%<br>• Time saved per visit = 25min<br>• Average hourly salary = $150<br>• Total impact = ~$310Mn | • # of devices = 6k<br>• $ per machine = $10k<br>• License fee = 5% of machine cost<br>• Market size = $3Mn |

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# Future roadmap

| Today | 2020 | 2022 | 2022 |
|---|---|---|---|
| Current Prototype | Version 1.0 | Version 2.0 | Version 3.0 |
| • Accuracy of 95 | • Development of Patient facing free application<br>• Development of doctor facing application with comprehensive report features<br>• Improve model accuracy based on field trials<br>• Apply for FDA and CE mark approvals | • Extend the model for fundus images obtained from portable cameras for pre diagnosis<br>• Collect and build OCT image database for improved Glaucoma model accuracy and development of new disease models | • Expand the model for other diseases such as diabetic retinopathy, macular degeneration<br>• Autnomous detection with minimal doctor supervision |

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