visulytix

Pegasus v1.1

Product Brochure

Our Mission

AI Solutions for Ophthalmology

Our mission is to provide rapid and clear essential information to clinical decision makers, empowering them to make the best decisions for their patients.

Our clinical decision support solutions assist in the early detection of sight threatening conditions giving patients the best possible outcomes and supporting the transition towards value based healthcare.

What we do

At **Visulytix**, we have developed cutting-edge *Artificial Intelligence* (AI) solutions to improve the accuracy and delivery of eye-care.

Our software provides *accurate, reliable* and *immediate* decision support in diagnostic eye-care, ranging from screening and triage to quality assurance for eye-care professionals.

Pegasus brings *specialist level accuracy* to the interpretation of OCT and Fundus imaging, making it *accessible to all healthcare professionals*.

Professionals can use **Pegasus** to help manage patient flow and and ensure urgent cases are referred to a specialist as soon as possible.

Our high level of accuracy *minimises false positive referrals and prevents false negatives.* **Pegasus** is transparent and granular, allowing eye-care professionals to use our solution for quality assurance while reducing clinical error and unwanted variation.

> ❝ This is the future of eye care ❞

Professor L. Pasquale - Professor of Ophthalmology, Harvard University

ABCs of Health AI

Healthcare is changing. Advances in Artificial Intelligence are among a wave of technological advances tipped to revolutionise the way healthcare is delivered over the next ten years.

At **Visulytix**, we believe AI solutions must be *delivered in partnership* with those who know best about clinical care, and they must put patients first. *Patients' interests* are at the heart of everything we do at Visulytix, and we have designed our solutions around four key principles:

Fairness and Granularity

Patients and clinicians rightly require the decisions underpinning care to be just. Our solutions show clinicians the precise features our algorithms use to base their decisions. Our decision support tools reduce inter-observer variability ensuring more consistent diagnoses and reducing any potential bias.
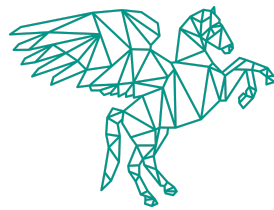
Improving Access for Patients

Our solutions are cloud-based, allowing use in hospitals and community care settings. By bringing specialist level decision support to a range of settings, we empower healthcare professionals to provide optimal care at a fraction of the cost and in a fraction of the time.

Evidence Based

Clinicians and patients demand that new healthcare technologies must be supported by a robust evidence base. Our solutions are underpinned by high quality evidence and our work is constantly subject to audit and quality improvement.

The Gift of Time

The patient-clinician relationship is at the heart of medical care. Our solutions aim to ease the pressures on healthcare professionals, giving them the time to do what they do best - caring for patients.
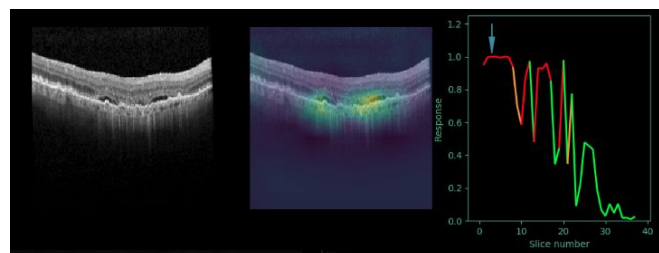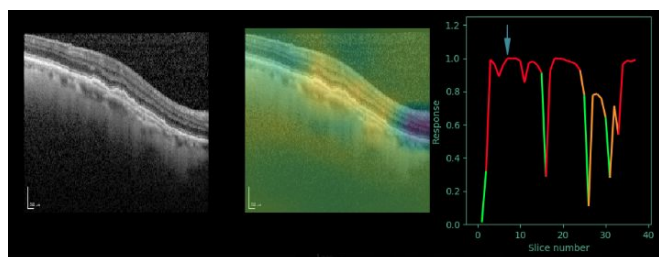
Pegasus

Pegasus is an accurate, point-of-care, single software solution to interpret *Fundus* and Macula *OCT* images.

Pegasus for OCT

The *OCT assistant* analyses for anomalies in three dimensions, providing insight in to the health of the retina and macula. **Pegasus** is granular, indicating signs of common treatable eye diseases on a heatmap and allowing pinpointing of anomalies in slice-by-slice analysis.

Region of interest identified as showing features of Wet AMD

Region of interest identified as showing features of Dry AMD

Pegasus decision support can detect the earliest signs of chronic treatable eye conditions, including Age-Related Macular Degeneration (AMD) and Diabetic Macular Edema (DME), thereby allowing earlier treatment to stem progression. These chronic diseases contribute significantly to the global demand for eye care services.
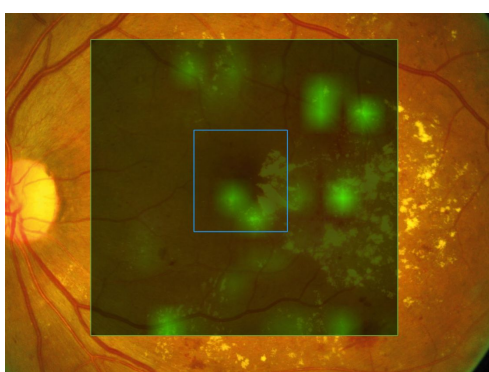
AI Performance for OCT Macula Analysis

Anomaly	Detection of pathological or acquisition-related anomalies	**Sensitivity**: 98% **Specificity**: 99.6%
Diabetic Macular Edema (DME)	Detection of features consistent with the presence of DME	**Sensitivity**: 94% **Specificity**: 94%
Dry Age-Related Macular Degeneration (AMD)	Detection of features consistent with the presence of Dry AMD	**Sensitivity**: 97% **Specificity**: 85%
Wet Age-Related Macular Degeneration (AMD)	Detection of features consistent with the presence of Wet AMD	**Sensitivity**: 96% **Specificity**: 79%

All algorithms are clinically validated and perform comparably to Ophthalmologists.
(Please contact us for further details)
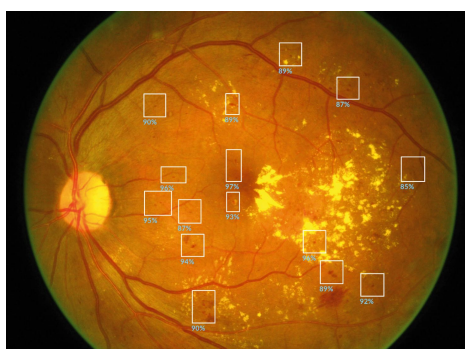
Pegasus for Fundus

The *Fundus assistant* provides professionals with insights on the health of the retina and optic disc, highlighting detected features and classifying major common eye diseases. **Pegasus** allows professionals to review features it has identified and used in its decisions. **Pegasus** is capable of screening for conditions such as glaucoma and diabetic retinopathy. In addition, **Pegasus**' macular anomaly detection can identify pathologies consistent with AMD and DME, making it one of the most comprehensive AI decision support systems in the world today.
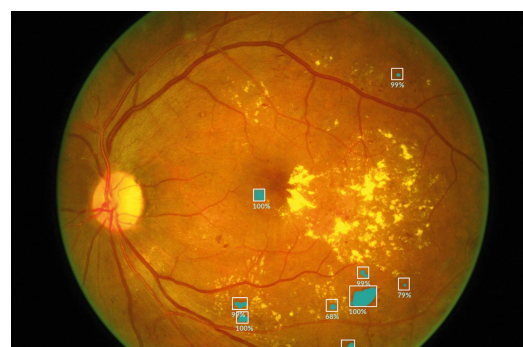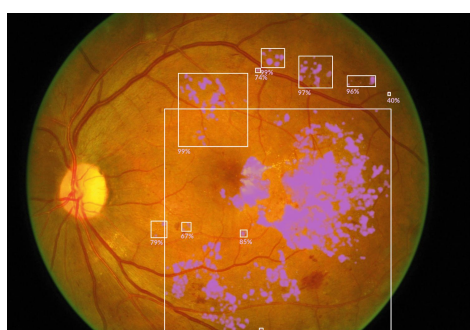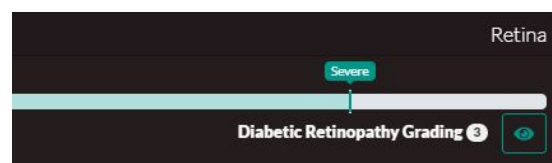
Anomaly Finder

Vertical Cup to Disc Ratio (VCDR)

Micro Aneurysms

Haemorrhages

Exudates

Diabetic Retinopathy Grading

AI Performance for **Fundus**

Optic Disc Analysis		
Disc Anomaly	Detection of features that are indicative of optic disc pathologies.	**Sensitivity:** 80.9% **Specificity:** 86.0%
VCDR	Estimate of the cup-to-disc ratio measured in the vertical direction (inferior - superior).	**Error (RMSE):** +/- 0.068
Macula Analysis		
Macula Anomaly	Detection of features that are indicative of macular pathologies.	**Sensitivity:** 80.7% **Specificity:** 80.7%
Retina Analysis		
Diabetic Retinopathy Grading	Severity grading of DR: Normal, Mild, Moderate, Severe, Proliferative *Based on International Clinical Diabetic Retinopathy Disease Severity Scale*[1]	**Standard performance:** Sensitivity: 93.4% Specificity: 93.4% **Portable fundus performance:** Sensitivity: 84.2% Specificity: 84.2% **For moderate or worse (referable) DR.** *Note that DR screening performance is suboptimal when using portable cameras, for both human graders and Pegasus.*

All algorithms are clinically validated and perform comparably to Ophthalmologists.

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[1] http://www.icoph.org/dynamic/attachments/resources/diabetic-retinopathy-detail.pdf

Compatibility & Pricing

Pegasus is *device agnostic*!

➔ **Pegasus** is available as a cloud solution and be accessed via a web browser (Edge, Chrome, Firefox, Safari)

Uploads to the Fundus assistant can be made in any popular image format, including JPEGs, TIFs and PNGs. The OCT assistant supports multiple popular video formats including AVI, MP4 and more.

➔ **Pegasus** is available on a Pay Monthly (Subscription) or Pay As You Go basis.

At **Visulytix**, we work with your organisation to provide the solution best suited for you. If you have any questions, please contact our Business team at:

Michael Scaife

Michael@visulytix.com

UK (+44) 7988 380256

Ana Rocha

Ana@visulytix.com

UK (+44) 7450 272527

❝ What I like about your company is your willingness to **make your software more customer friendly.** ❞

Dr V. R. T. Tetali - Consultant Ophthalmologist MS, Narayana Reddy Eye Hospital

Collaborators

Ophthalmica (Greece)
Address: Vas. Olgas 196 & Ploutonos,
Thessaloniki, Greece.
Postcode: 54655
Tel no.: +30 2310 263063

https://www.ophthalmica.gr/en/

Orbis Flying Eye (United Kingdom)
Address: 6th Floor 10 Lower Thames Street
London, United Kingdom
Postcode: EC3R 6AF
Tele no.: +44 (0)20 7608 7260

https://gbr.orbis.org/en

Narayana Reddy Eye Hospital (India)

Address: Gandhi Nagar
Anaparthy, Andhra Pradesh, India
Postcose: 533342
Tel no.: +91 88572 27422

https://www.nhp.gov.in/hospital/narayana-r
eddy-eye-hospital-east_godavari-andhra_pr
adesh

Hitech Diagnostic Center (India)

Address: 1, Millers Rd, Kilpauk,
Chennai, Tamil Nadu, India
Postcose: 600010
Tel no.: +91 44 4291 9999

http://www.hitechlabsindia.com/2010/index
.html

Leadership

CEO

Jay Lakhani MEng is the CEO of Visulytix. He previously worked in Finance as an Equity Analyst for Principal. Jay's interest in medical imaging stems from his masters thesis, which focused on image analytics using MRI, while he was an Engineering graduate at the University of Oxford.

CMO

Mr Sameer Trikha MBA FRCOphth is an internationally renowned Consultant Ophthalmic Surgeon at Kings College Hospital NHS Foundation Trust in London. He is passionate about big data and the development of new, scalable models of Eye care globally. He has authored 25 peer reviewed papers, written 2 books, and is regularly invited to give talks on applied AI in Ophthalmology around the world.

CTO

Nicolas Jaccard earned his PhD in Biomedical Image-processing at University College London. He developed modelling and machine-learning methods across a wide range of fields, including Biotechnology, Security Science, and Decision-Support in Healthcare.

Glossary

Diabetic Retinopathy

Diabetic Retinopathy is a complication of diabetes, a metabolic disorder whereby the body cannot regulate the level of blood glucose effectively. It is a worldwide problem, and the leading cause of blindness in patients between 20 and 64 years of age. The retina of the eye is usually affected, resulting in leakage of blood vessels and damage to the vision. Prompt recognition and treatment is paramount to minimize permanent sight loss.

Glaucoma

Glaucoma is a degenerative eye condition, typically initiated by raised eye pressure. The optic nerve starts to develop damage, eventually resulting in irreversible loss of vision. Importantly, patients with glaucoma rarely experience symptoms, and it is therefore labelled the 'silent thief of sight'. It is estimated that 80 million people will be suffering from glaucoma in 2020, and this will rise to 130 million by 2040. Early screening for glaucoma is essential, particularly if there is a family history of the condition.

Age-Related Macular Degeneration

AMD is a degenerative eye disease affecting 5% of the population over the age of 60. AMD is projected to affect 196 million people worldwide by 2020, and is characterized by abnormal changes in the macula – the central part of the retina that is extremely important for patients' detailed vision. There are two main forms of AMD: the dry form and the more severe, sight-threatening wet form. Early recognition of the disease is paramount to effective treatment. Once diagnosed, the disease is monitored with monthly scans which all currently need to be reviewed by an Eye specialist.