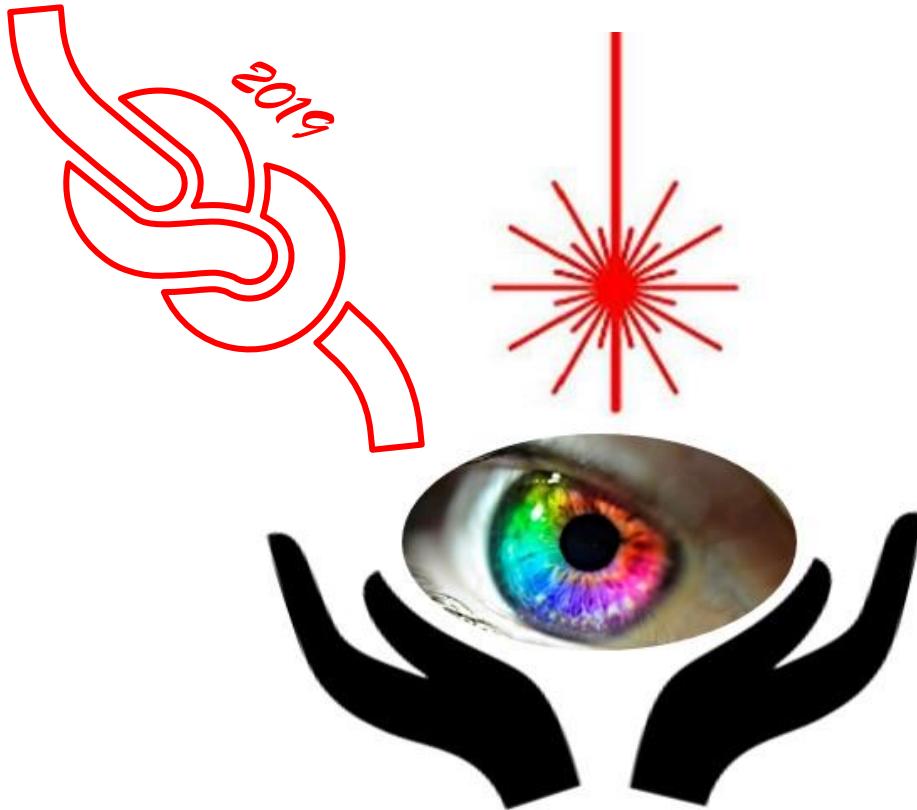


Fast SS-OCT for eye-disease diagnosis and surgery

CAREGLANCE S.R.L.

MARIA CHIARA UBALDI, CEO



CareGlance S.r.l.

Our mission

Transforming Optical Coherent Tomography in a real time, portable eye-disease diagnosis and surgery technique by fast Swept Sources and Optical Integration.

What is OCT

Optical Coherent Tomography

- Technology of choice for retinal diseases diagnosis and monitoring (e.g. glaucoma, ERM,...);
- OCT works like an in-situ, non-invasive biopsy, having applications in many fields besides ophthalmology;
- Most compact solutions are tabletop systems, being far from true portability.

Diagnosis

Glaucoma

Cataract

Epiretinal Membrane

Surgery

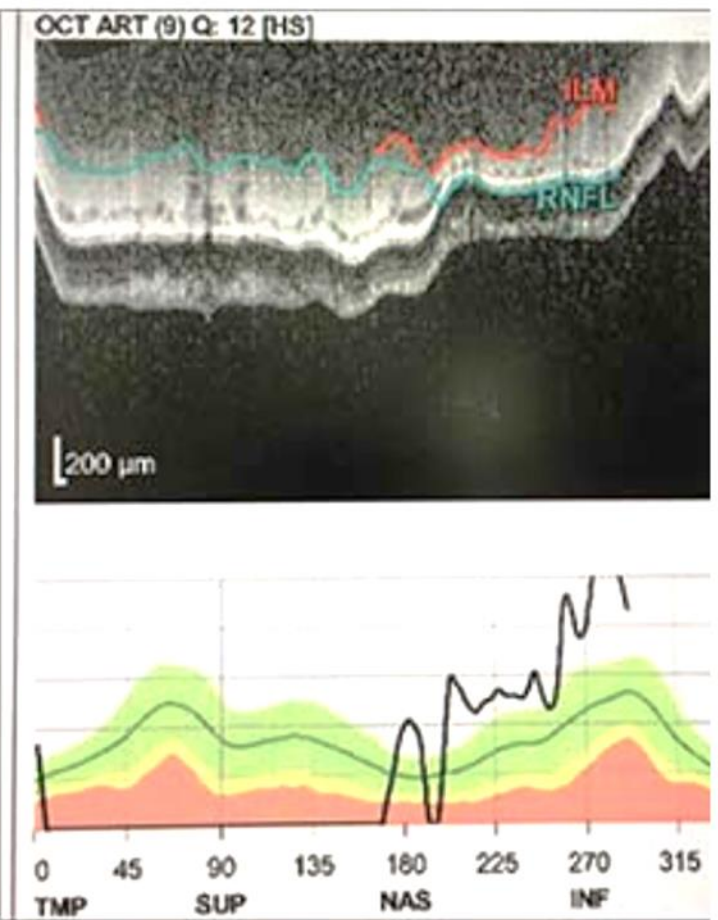
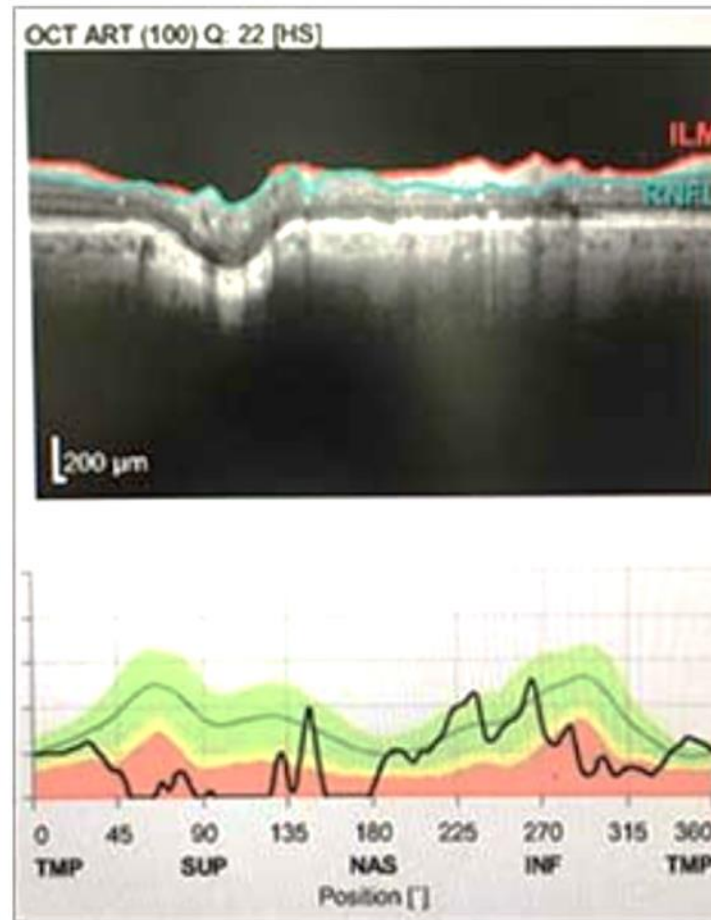


Current SS-OCT limits

- **Test duration:** frequently the test is repeated due to patient movement during acquisition.
- **Equipment Dimension**
it is usually “stationary” system, a portable or small tabletop equipment will be very useful;
- **Equipment Cost**
in between 40 k€ and 100k€, frequently too expensive for small clinics.

Swept Laser is the key issue

It is **complex**, relatively **slow** and **costs** about 30% of the whole equipment



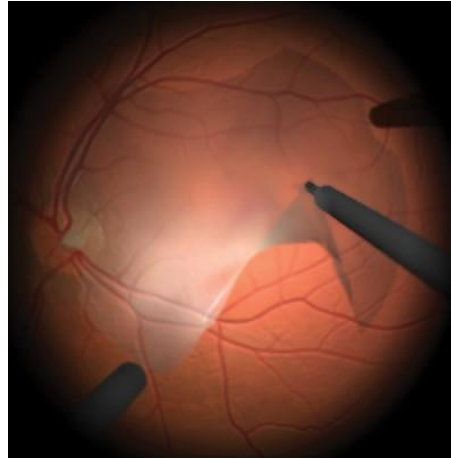
A motion artifact caused by patient movement affected the data in the left-hand scan, making the retinal nerve fiber layer appear to zigzag. The scan on the right shows both a movement artifact and incomplete segmentation;

Liu Y, Simavli H, Que J, et al. Patient characteristics associated with artifacts in Spectralis optical coherence tomography imaging of the retinal nerve fiber layer in glaucoma. Am J Ophthalmol 2015;159:565-576.

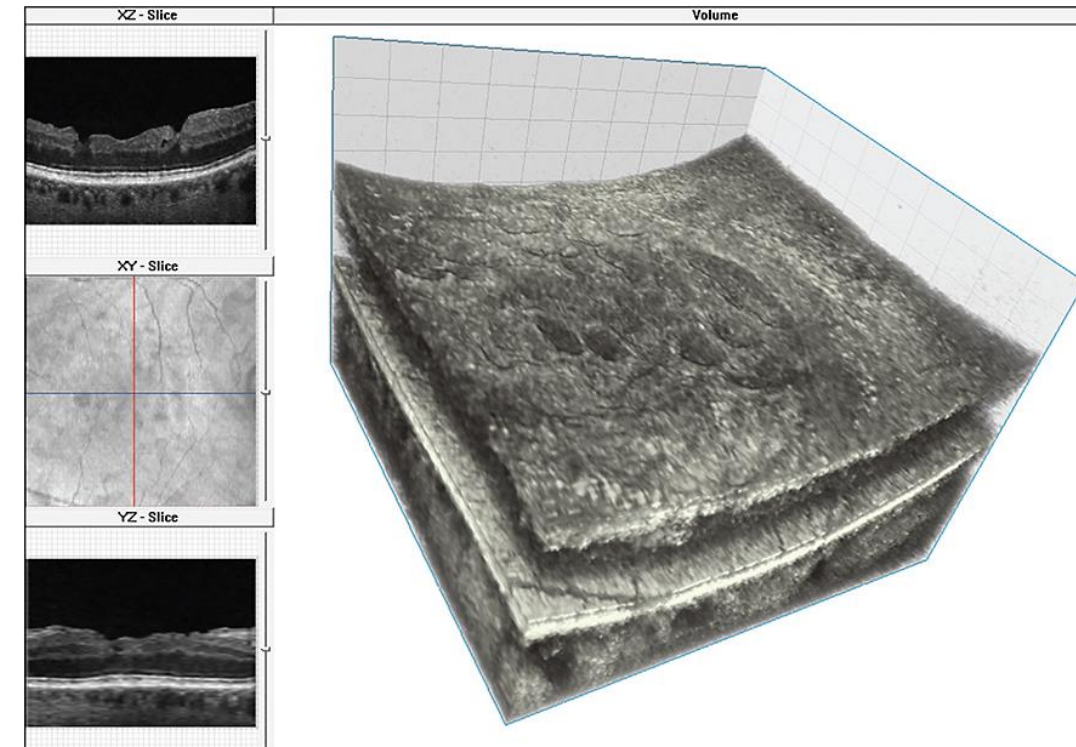
Revolutionizing Eye Surgery

- Eye surgery is mainly based on low invasivity techniques, thus imaging plays a key role;
- Monitoring is usually performed by a camera (2D images);
- 3D images would revolutionize surgery techniques;
- Today standard OCT cannot be used since it is not truly real-time.

CareGlance laser can revolutionize eye surgery by real time OCT



Surgery camera
real time image
during retinal
membrane peeling



OCT image of an eye with surgically closed macular hole with ILM peeling as viewed on volume visualization- Single slices are reported on the right.

Retinal Physician, Volume: 13, Issue: April 2016

.. in the longer term, the potential exists to integrate OCT to move from 2D to 3D visualization within the tissue. (Insight-Zeiss site)

Oscar M. Carrasco-Zevallos, et. Al., *Review of intraoperative optical coherence tomography: technology and applications*, Biomed Opt Express. 2017 Mar 1; 8(3): 1607–1637.

CareGlance solution

Innovative laser
technology for
OCT systems



FAST

One axial scan in a microsecond

Completely eliminates artifacts from movement



SMALL

Enables Portable devices

Small footprint with micro-optic technology



COST-EFFECTIVE

Low cost Devices

Low BOM and high manufacturing yield



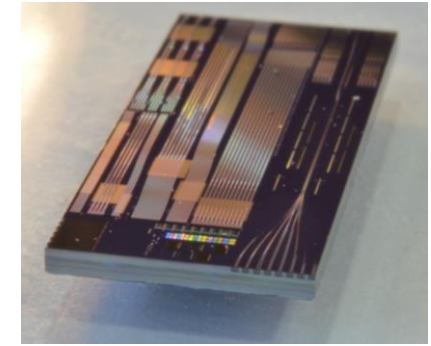
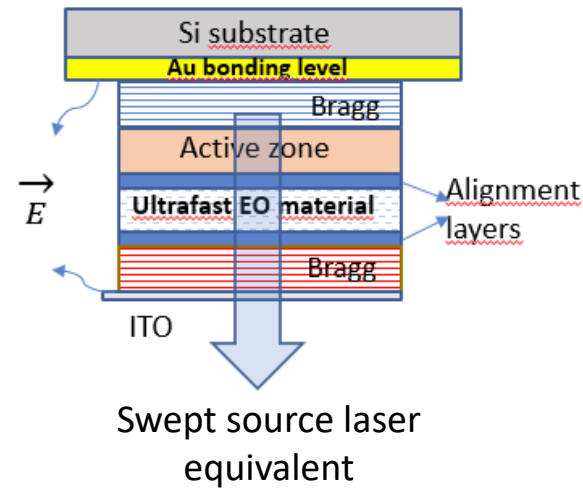
RELIABLE

No moving parts (e.g. MEMS) inside the cavity

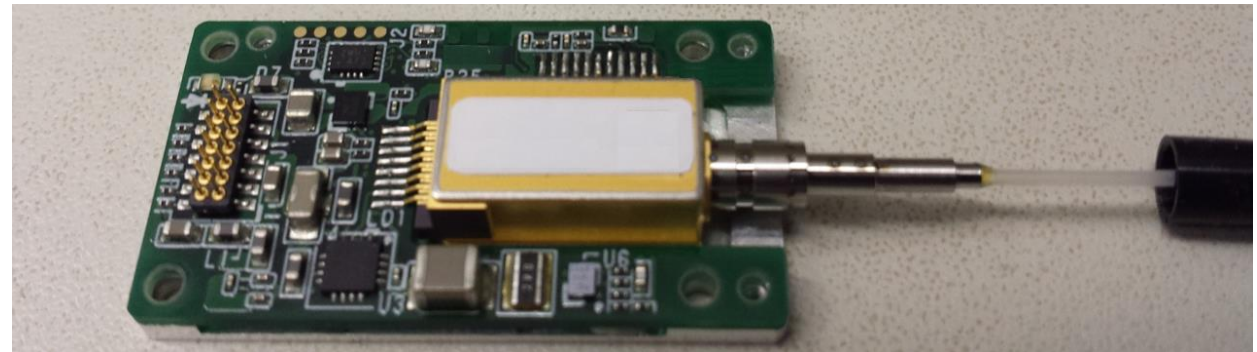
Beyond the Real Time Swept Source

- Large cost and dimension reduction can be achieved by optical integration;
- Integrating the whole optical system in a single chip is feasible with silica-on-silicon technology;
- The integrated chip together with electronic driver is the OCT micro-module core
- CareGlance Team has a long-lasting experience in integrated devices field and a very preliminar feasibility is ongoing;

Beyond the laser, CareGlance can transform OCT in a readily available and accurate test system.



Si/N platform OCT interferometric engine



OCT portable micromodule with pigtailed fiber and control electronics



mariachiara.ubaldi@careglance-srl.it

Thank you

MARIA CHIARA UBALDI, CEO