DynAMic

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DynAMic starts exploitation of its project results

Targeting higher resolution, deeper imaging with high spatio-temporal performance in biological tissue, the DynAMic project (2020-25) is pushing the limits of technologies that are able to overcome limitations of current imaging systems, in particular regarding several parameters such as contrast specificity, scattering and aberrations.

Considering the latter, which is one of the main limitations for deep imaging with high contrast and resolution in biological media, Adaptive Optics (AO) enables to compensate for optical aberrations and to restore diffraction-limited imaging. Either in ophthalmology or in microscopy, AO has demonstrated significant improvement of image quality over the last years.

Adaptive Optics…

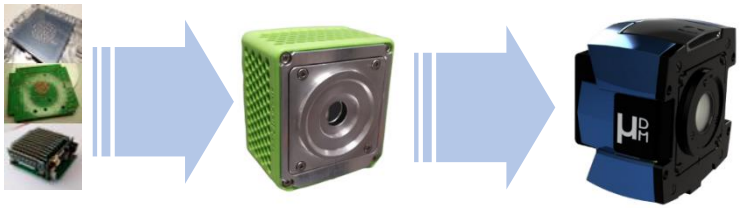
However, despite major results demonstrating such improvements, AO has not yet been widely transferred to industrial systems. Indeed :

- AO requires a specific expertise to be implemented in a robust manner, i.e. being able to provide image improvement in all situations
- AO components, in particular wavefront modulators such as Deformable Mirrors (DM), are not yet fully optimized for use in microscopy regarding key parameters such as linearity, dynamic range, stability, integrability, or price/performance ratio.

The **µDM** deformable mirror provides a set of specifications tailored to microscopy & ophthalmology:

- huge dynamic range
- perfect linearity (>99%), no hysteresis
- high optical surface quality, down to 3nm rms
- high actuator count (91), with optimal layout
- high temporal stability
- intrinsically achromatic
- high reflectivity (>97%)
- built-in electronics, USB3

In this context, Imagine Optic (IO) – an industrial member of the DynAMic project - has developed a new generation DM aiming at fulfilling the previous combination of unmet needs for imaging applications in life sciences.



DM development: achieved R&D steps during the DynAMic project, from components and sub-assemblies (left), to first prototypes (middle), and final product (right)

… adapted to Microscopy

Taking advantage of its proprietary electromagnetic actuation technology, IO achieved a complete redesign of its MirAO line of DMs, from electronics to actuators and overall easiness of use, based on a design to cost process. On top of Dynamic needs, the device can benefit to multiple microscopy modalities such as Light-Sheet, multiphoton or SMLM, as well as to retinal imaging systems.

First deliveries in 2023

Before its official launch, the product has already been recognized as a relevant component enabling AO-enhanced imaging, with first sales achieved and delivery planned early 2023. DynAMic is proud to achieve early exploitation of its results, and happy that the scientific community can benefit from its outcomes.

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