

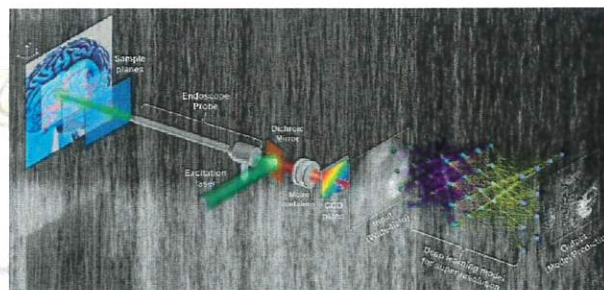


Title of Invention

PI : Prof. Yuan Luo.

Institute of Medical Device and Imaging, National Taiwan U.

Experience: He received his MSc and PhD degrees from the College of Optical Sciences at the University of Arizona in 2007 and 2008. After postdoctoral work at MIT, he joined National Taiwan University (NTU) in 2011, where he is now Director and Professor at the Institute of Medical Device and Imaging.



He also serves as Program Director of Precision Health and Intelligent Medicine at NTU and Associate Dean of the YongLin Institute of Health.

Market Needs:

There is a growing clinical demand for endoscopic technologies that offer high resolution, low invasiveness, and rapid imaging capabilities. This need is especially critical for real-time observation and surgical navigation in the brain and deep tissues, where endoscopic systems capable of surpassing the diffraction limit and performing multi-depth imaging are urgently required.

Our Technology:

This study proposes an AI-assisted "*tunable metasurface super-resolution fluorescence endo-microscopy system*". Using a Moiré metasurface lens, the system achieves multi-depth focusing without mechanical scanning. It integrates structured illumination microscopy (SIM) and deep learning model, significantly reducing the number of required images and reconstruction time. The result is a fast and super-resolution optical sectioning imaging system.

Strength:

- A tunable metasurface lens enables 3D image reconstruction
- Rapid acquisition of super-resolved optical sectioning images

Competing Products:

Confocal endoscopes/ Optical coherence tomography (OCT) endoscopes

Patent Status:

The related outcomes have been published in international journals such as *Advanced Science* and *Nano Letters*.

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