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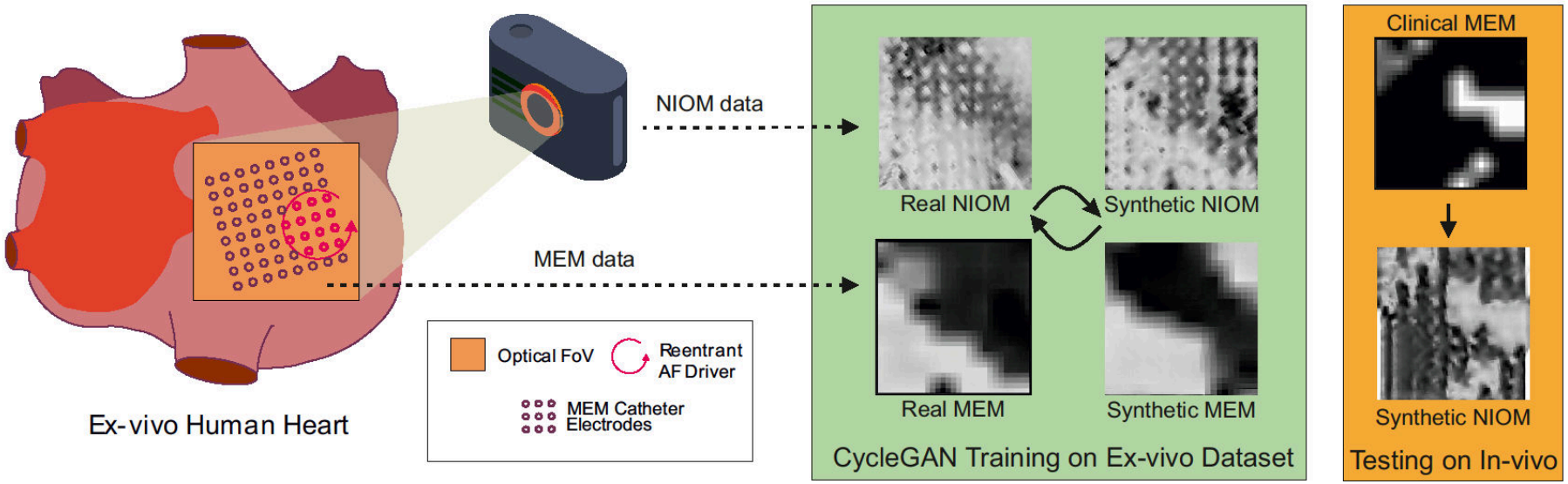
- The poor visualization of the Atrial Fibrillation (AF) source patterns in clinic
- Multi-Electrode Mapping (MEM) - clinical (in-vivo), but low resolution
- Optical Mapping (NIOM) - higher resolution, but only for explanted tissues (ex-vivo)
- CycleGAN was trained to translate low-resolution MEM to high-resolution NIOM on AF episodes induced in explanted human hearts



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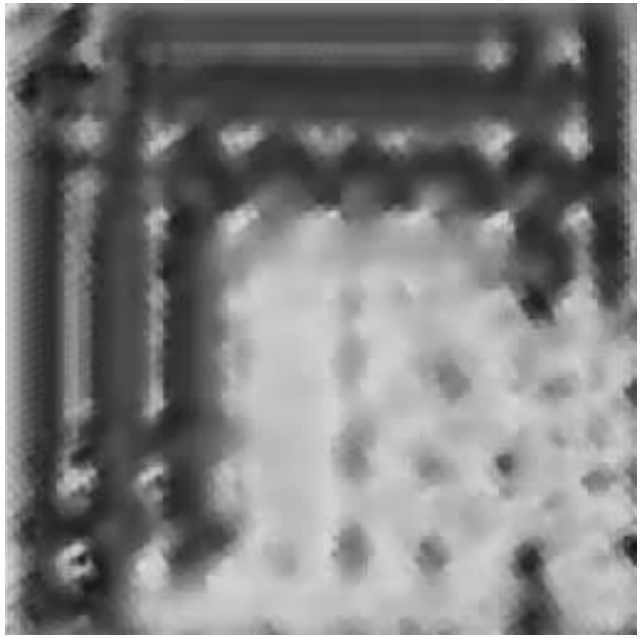

AF driver visualized by synthetic NIOM maps

New paradigm of *ex-vivo to in-vivo* learning: image-to-image translation model trained on explanted organs and then applied to the real clinical cases

	Mean SSIM	Mean Dice ratio
In-vivo cases	0.58 ± 0.05	1.37 ± 0.24

The dataset was provided by Wexner Medical Center OSU, USA (ex-vivo hearts by Fedorov lab and in-vivo cases by Dr. Hummel. The study was supported by NIH grants HL135109, HL115580 and the Bob and Corrine Frick Center for Heart Failure and Arrhythmia (Prof. Fedorov) and RFBR grant 19-29-01240 “mk” (Prof. Dylov).