Abstract Submitted
for the OSF19 Meeting of
The American Physical Society

Holographic Visualization for Performance of Percutaneous Ablation of Solid Liver Tumors: Translating from Bench to First-in-Human Evaluation CREW WEUNSKI, Cleveland Clinic/John Carroll University, AYDAN HANLON, B.S., SARA AL-NIMER, M.S., AMELIA CHAPMAN, B.S., KARL WEST, M.S., JEFFERY YANOF, PH.D, CHARLES MARTIN III, M.D., Cleveland Clinic — Percutaneous thermal ablation (PTA) of solid tumors is the leading, minimally-invasive treatment used in Interventional Oncology, especially in the liver. However, surgeons currently use 2D screens with image guidance for an inherently 3D task, which can lead to inaccurate ablation probe placement, tumor recurrence, and procedural complications. The objective of this study was to develop and evaluate true 3D-holographic guidance for PTA (3D-HPA) from bench to first-in-human clinical evaluation for liver tumors, leading to increased ablation accuracy and usability. 3D-HPA functions by projecting holograms of the patients anatomy and GPS-tracked probes directly onto the operative site with HoloLens (an untethered, head-mounted AR display) to overcome limitations of 2D screens. Probe placement accuracy and HoloLenss ease of use were assessed on the bench. Next, feasibility was assessed in a clinical study while maintaining standard of care. HoloLens image captures were reviewed from the first-in-human evaluation. Preliminary results show significant potential to improve PTA accuracy.

Crew Weunski
Cleveland Clinic/John Carroll University

Date submitted: 25 Sep 2019 Electronic form version 1.4