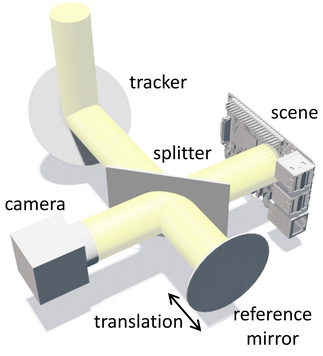
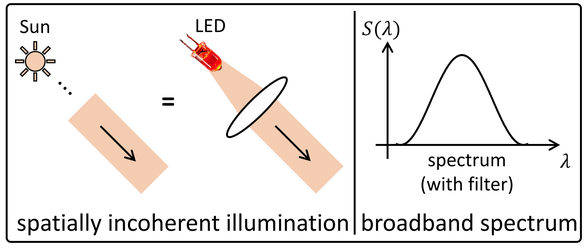
Passive Micron-Scale Time-of-Flight with Sunlight Interferometry

Alankar Kotwal, Anat Levin, Ioannis Gkioulekas | imaging.cs.cmu.edu/sunlight_interferometry

ALFRED P. SLOAN FOUNDATION · DARPA · NSF · Office of Naval Research ONR Science & Technology

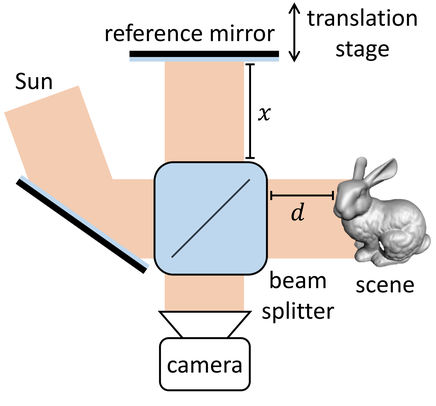


our goal: passive 3D sensing using sunlight...



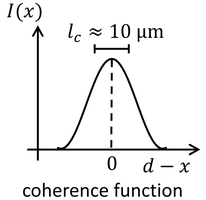
... without using **any** artificial illumination ...

Michelson interferometer

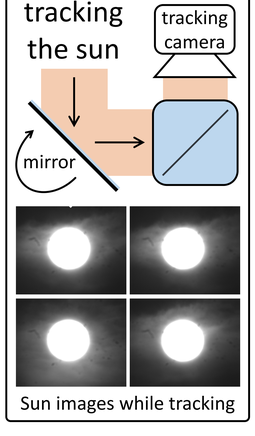


... with high depth resolution, ...

sunlight, 550 ± 20 nm spectral filter

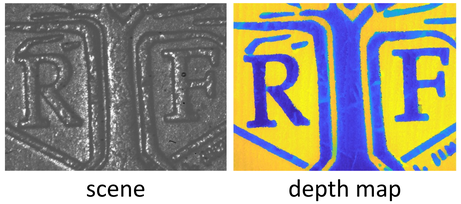


tracking the sun

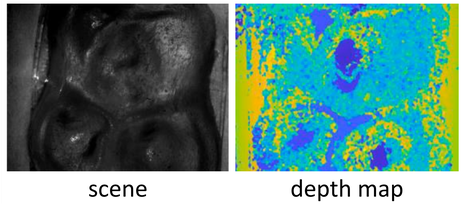


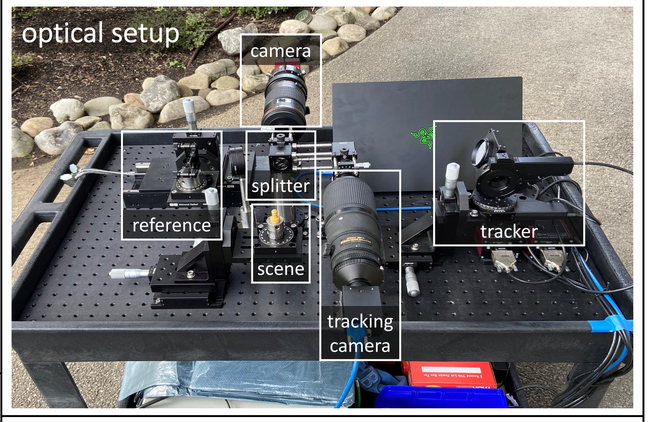
... outdoors under strong ambient light, vibrations and noise.

indoor light: we have a demo!

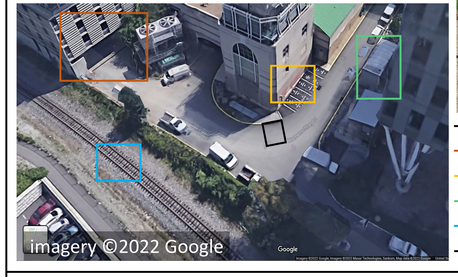


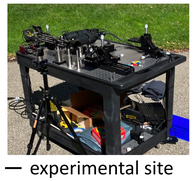
challenging scene: extreme low SBR





challenges and sources of error





- experimental site
- parking garage
- air outlet
- transformer
- train tracks
- scattered clouds

depth and imaging through scattering

coin behind scatterer