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

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https://imaging.cs.cmu.edu/sunlight_interferometry
[Kotwal et al., 2020]
dark room with curtains
artificial light sources
pneumatic vibration isolation
https://imaging.cs.cmu.edu/sunlight_interferometry
Passive micron-scale depth sensing

[Kotwal et al., 2020] ours

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Reference mirror
Splitter
Mirror
Scene
Camera

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Passive micron-scale depth sensing

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Setup

- Imaging camera
- Ref mirror
- Scene
- Tracking camera
- Tracking mirror on rotation stages

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Depth sensing: Raspberry Pi

rendered depth
texture-mapped
resistor and pad
conducting tracks

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Depth sensing: gummy bear

https://imaging.cs.cmu.edu/sunlight_interferometry
Seeing through scattering with sunlight

https://imaging.cs.cmu.edu/sunlight_interferometry
Indoor passive interferometry

scene

transient response

depth

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more details: https://imaging.cs.cmu.edu/sunlight_interferometry

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