

CVPR
JUNE 3-7, 2026



DENVER
COLORADO

UNREFLECT ANYTHING

RGB-ONLY HIGHLIGHT REMOVAL

BY RENDERING SYNTHETIC SPECULAR SUPERVISION



ALBERTO ROTA



MERT KIRAY



MERT ASIM KARAOGU



PATRICK RUHKAMP



ELENA DE MOMI



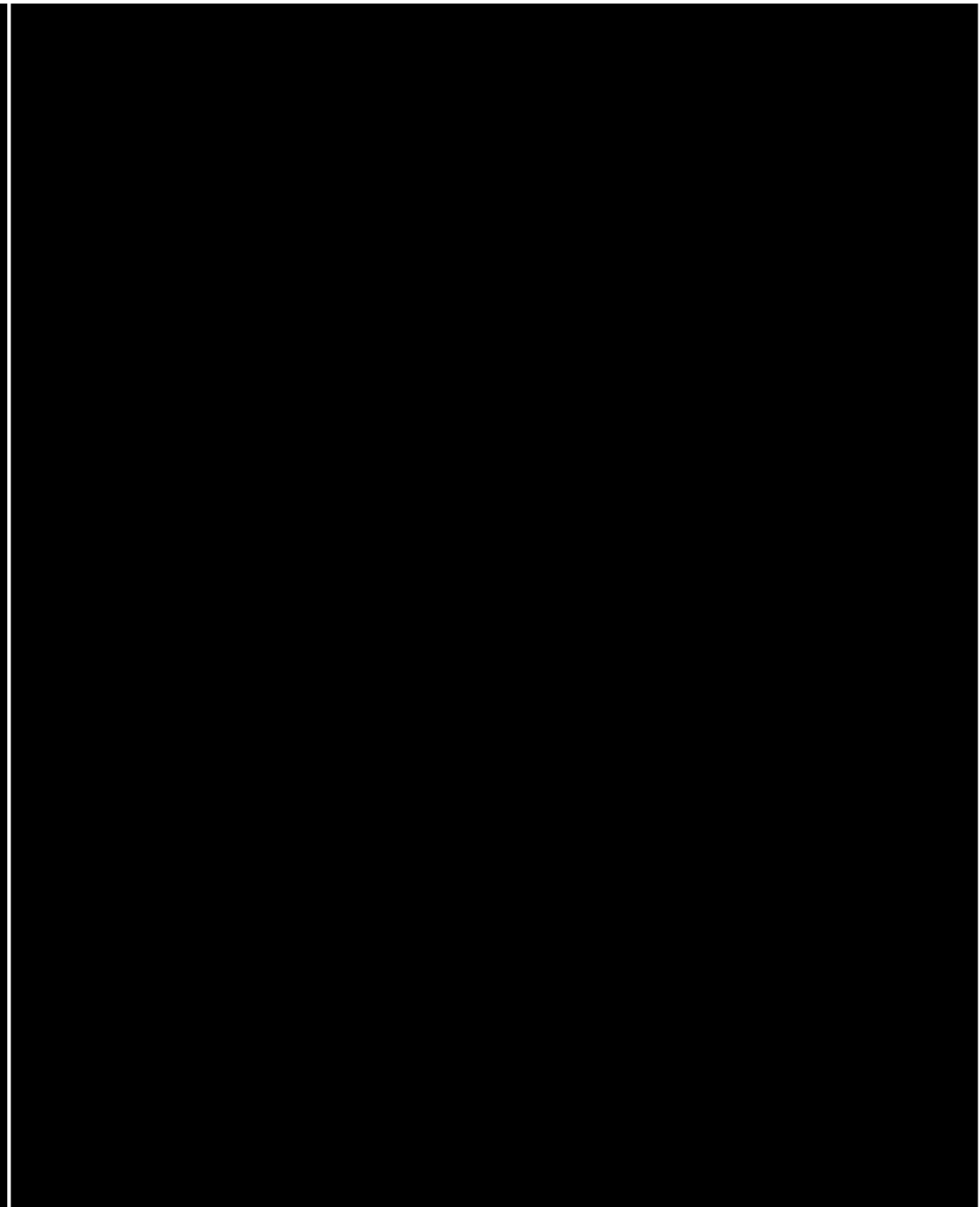
NASSIR NAVAB

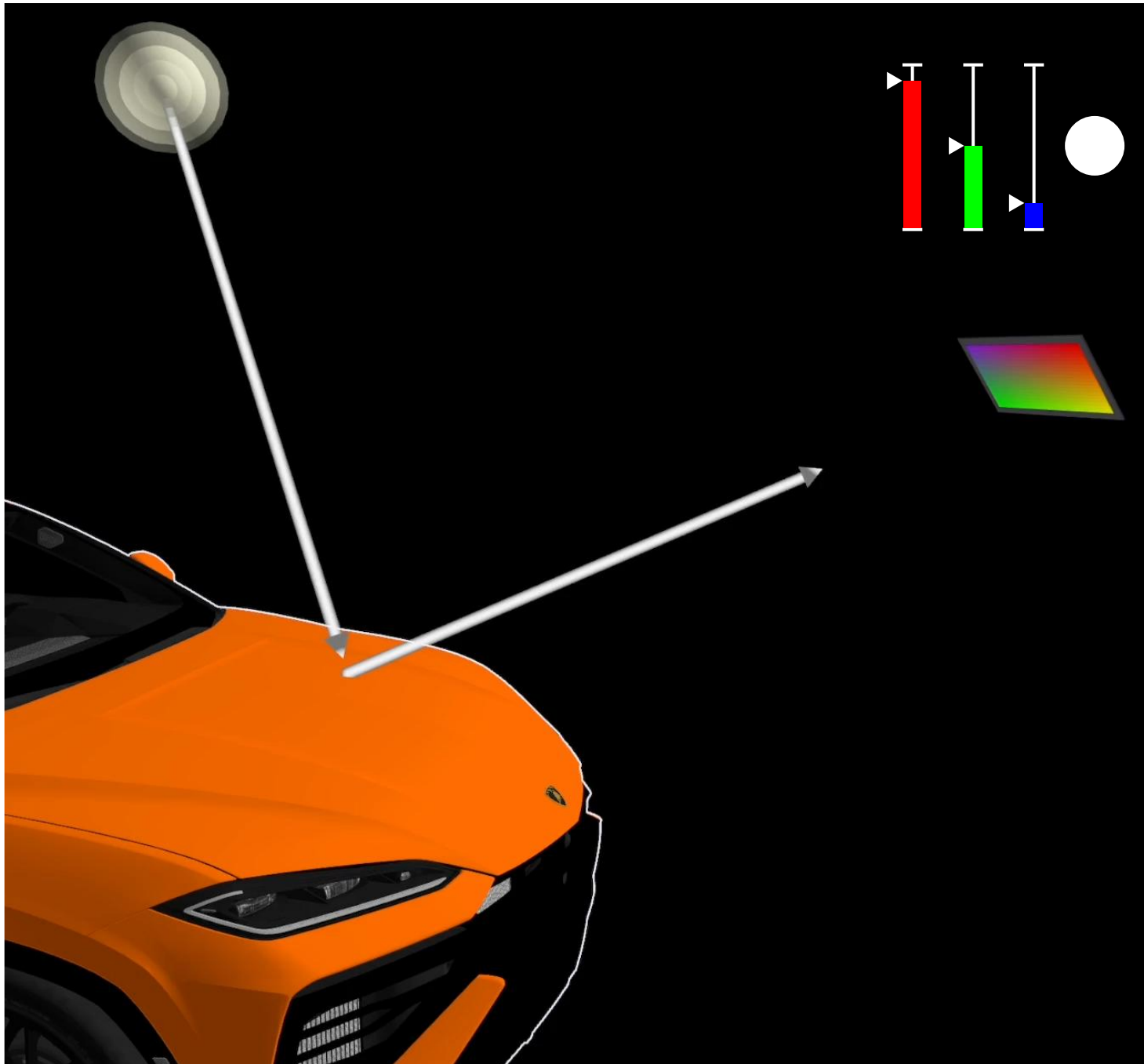


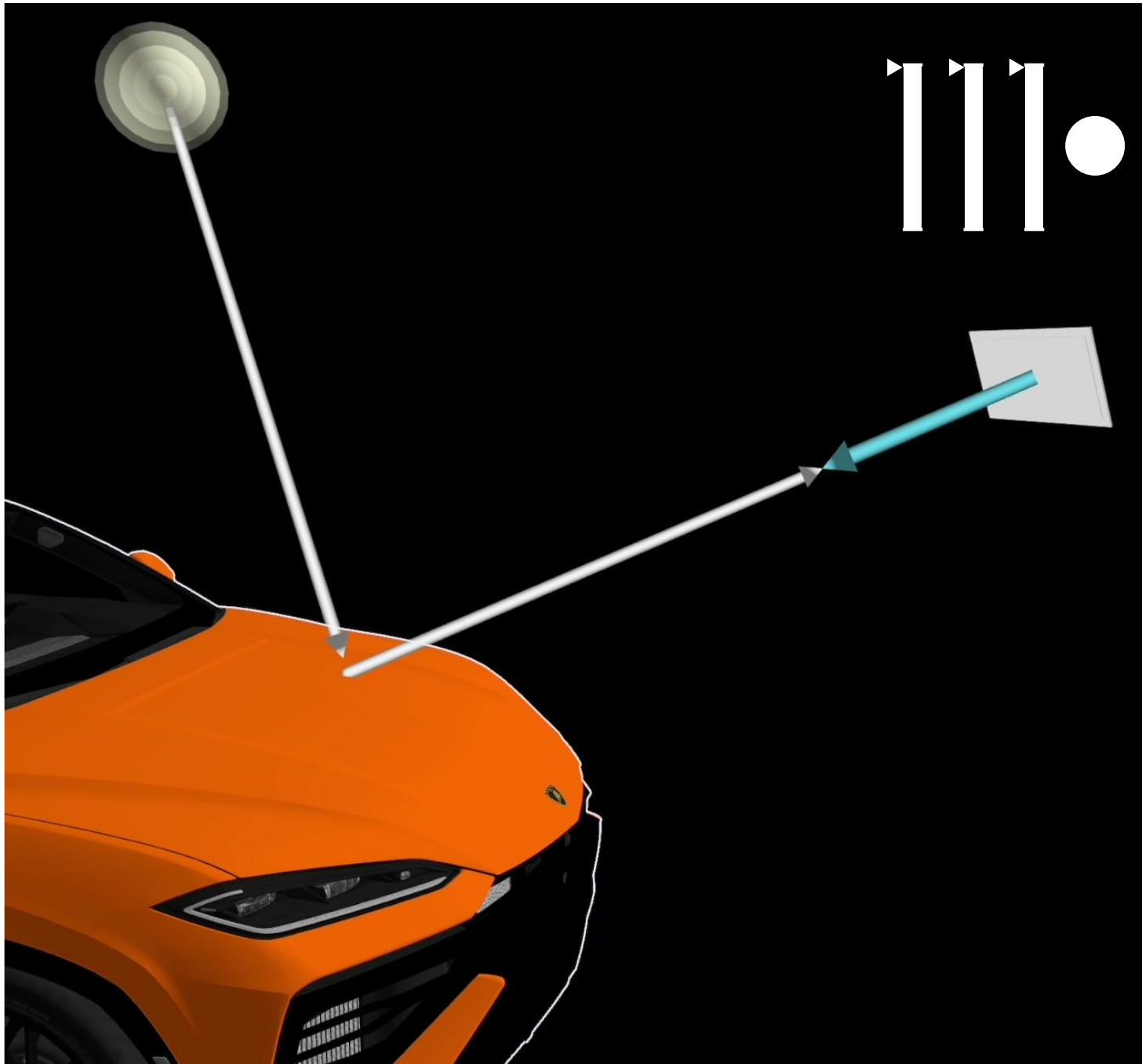
BENJAMIN BUSAM

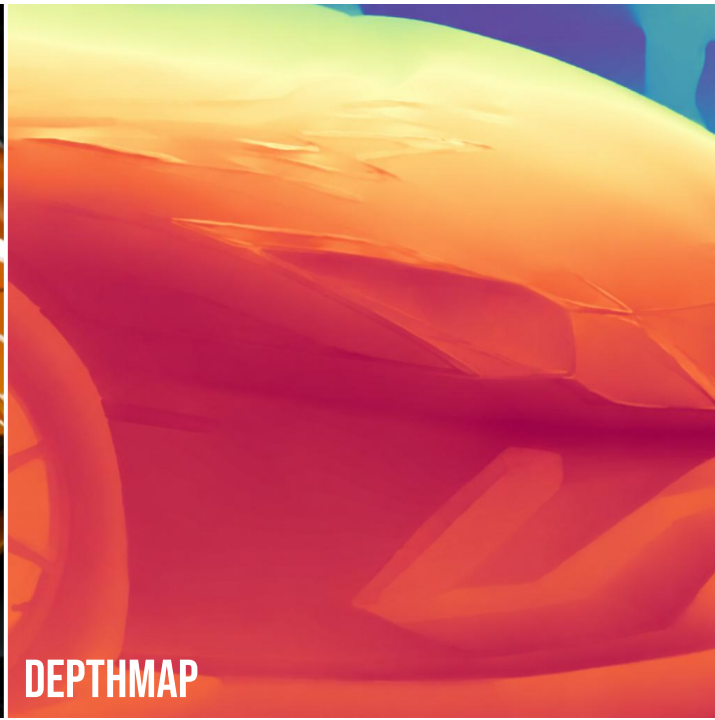








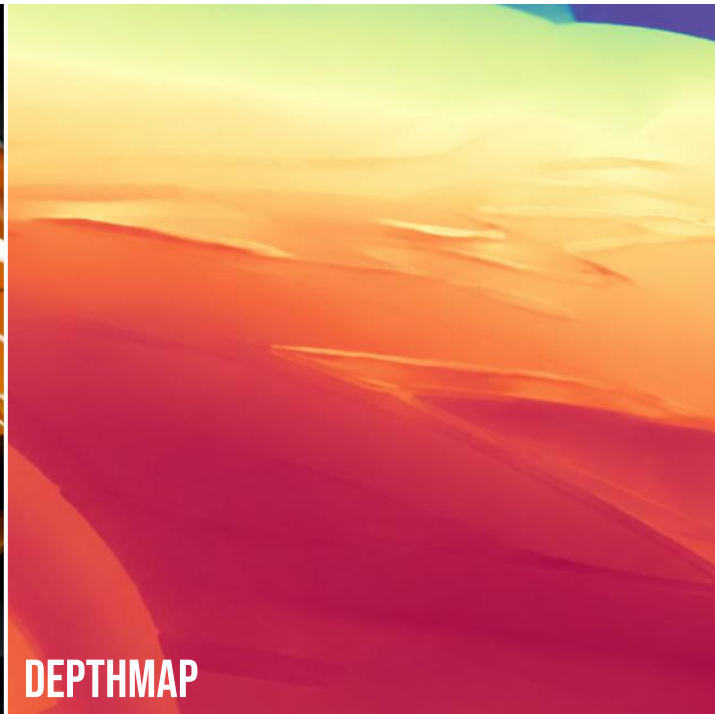




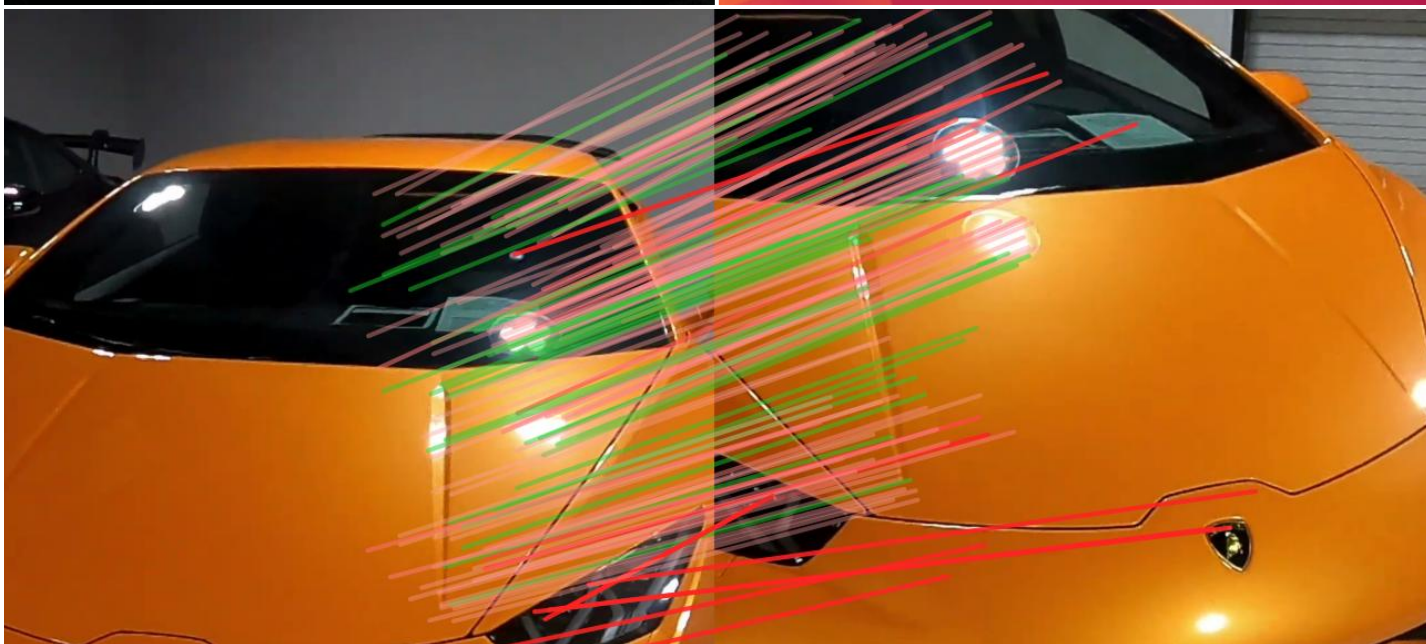
LOSS OF SURFACE DETAILS

PHOTOMETRIC CORRUPTION





LOSS OF SURFACE DETAILS



PHOTOMETRIC CORRUPTION

MULTI-VIEW INSTABILITY



SYNTHETIC^[1]

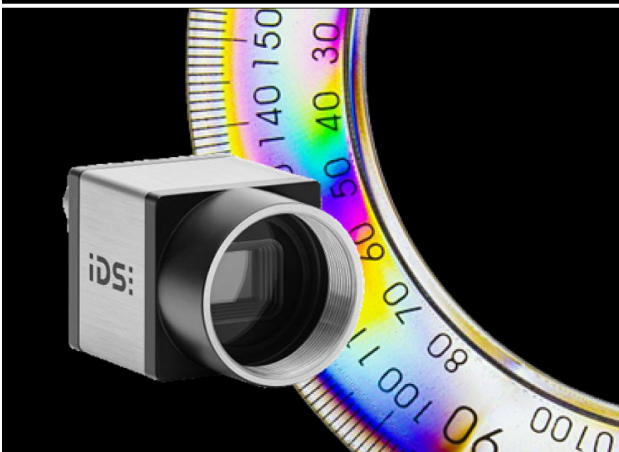


SHADED HDR
IMAGE



DIFFUSE
ILLUMINATION

POLARIZATION^[2]



SPECULAR HIGHLIGHTS
ARE LINEARLY POLARIZED



PHYSICS-GROUNDED

LONG SETUP AND RENDERING TIME
DOMAIN SHIFT

[1] ROBERTS, ICCV 2021

REAL-WORLD DATA

NOISY AT LOW BRIGHTNESS
SPECIALIZED HARDWARE

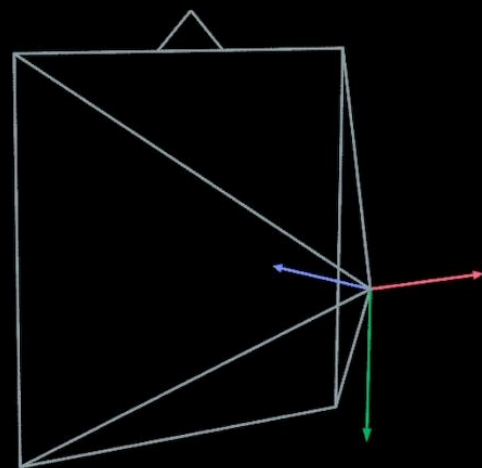
[2] JUNG, CVPR 2024



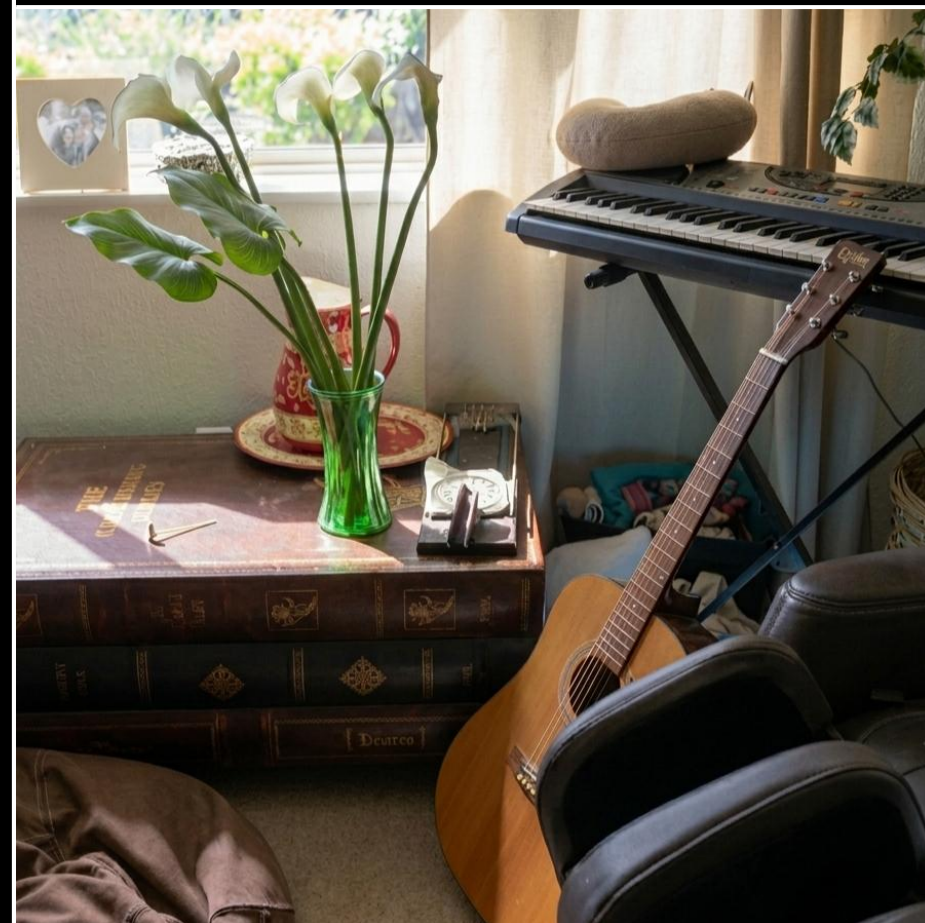
SYNTHETIC SPECULAR SUPERVISION

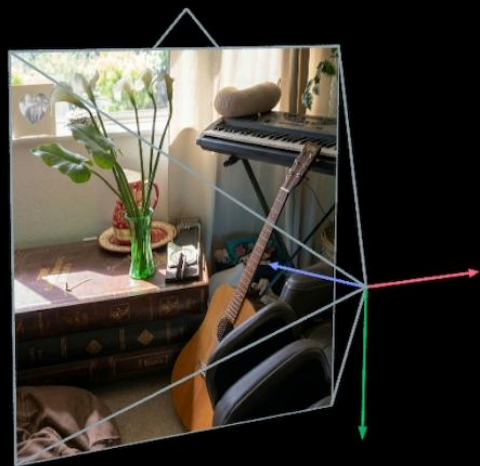






RGB





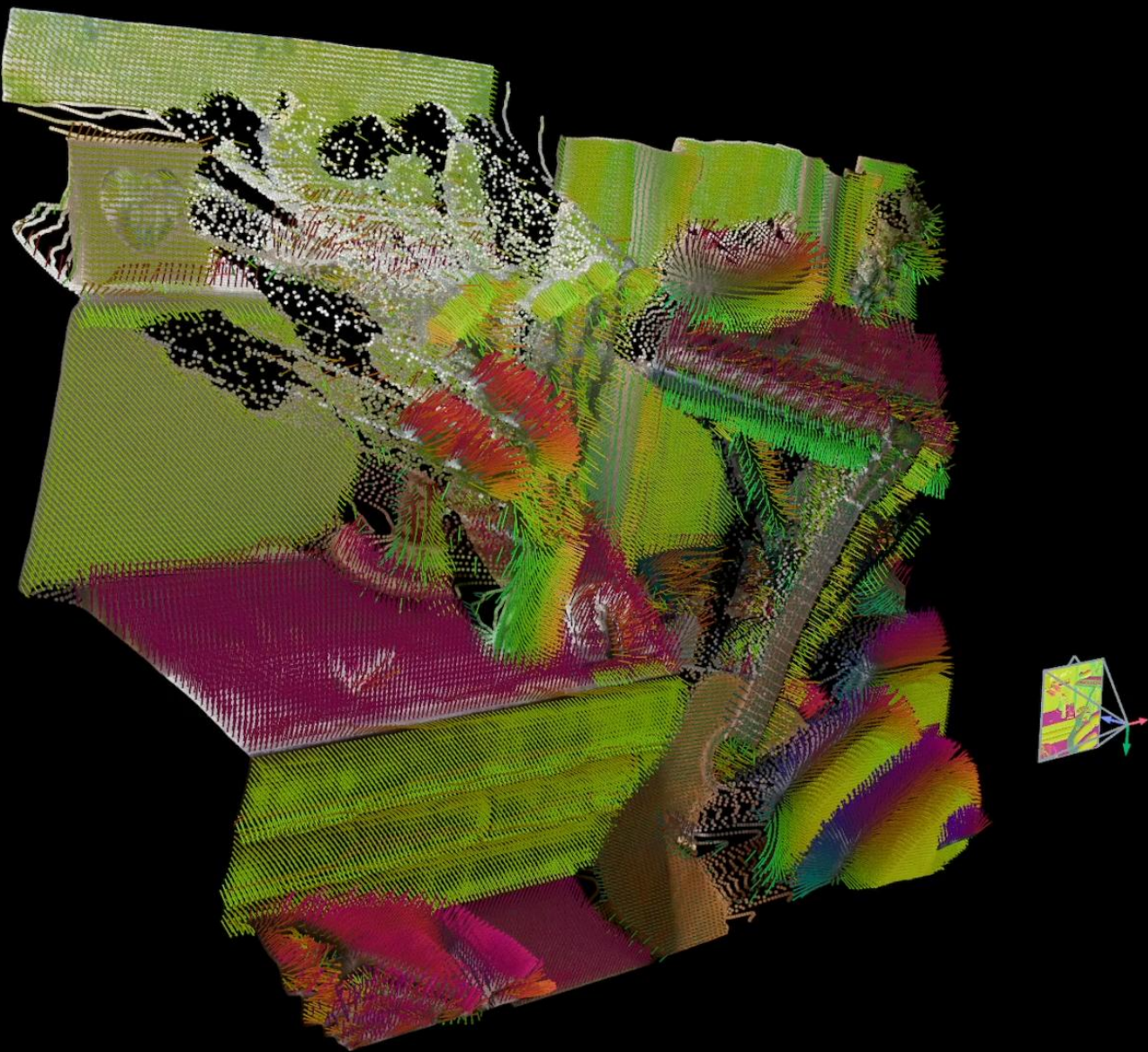
DEPTH MAP



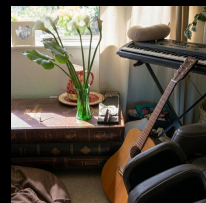


DEPTH MAP

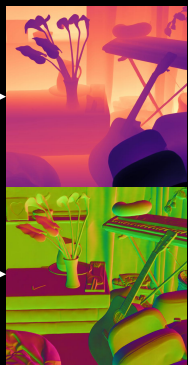




NORMAL MAP



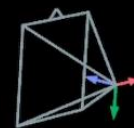
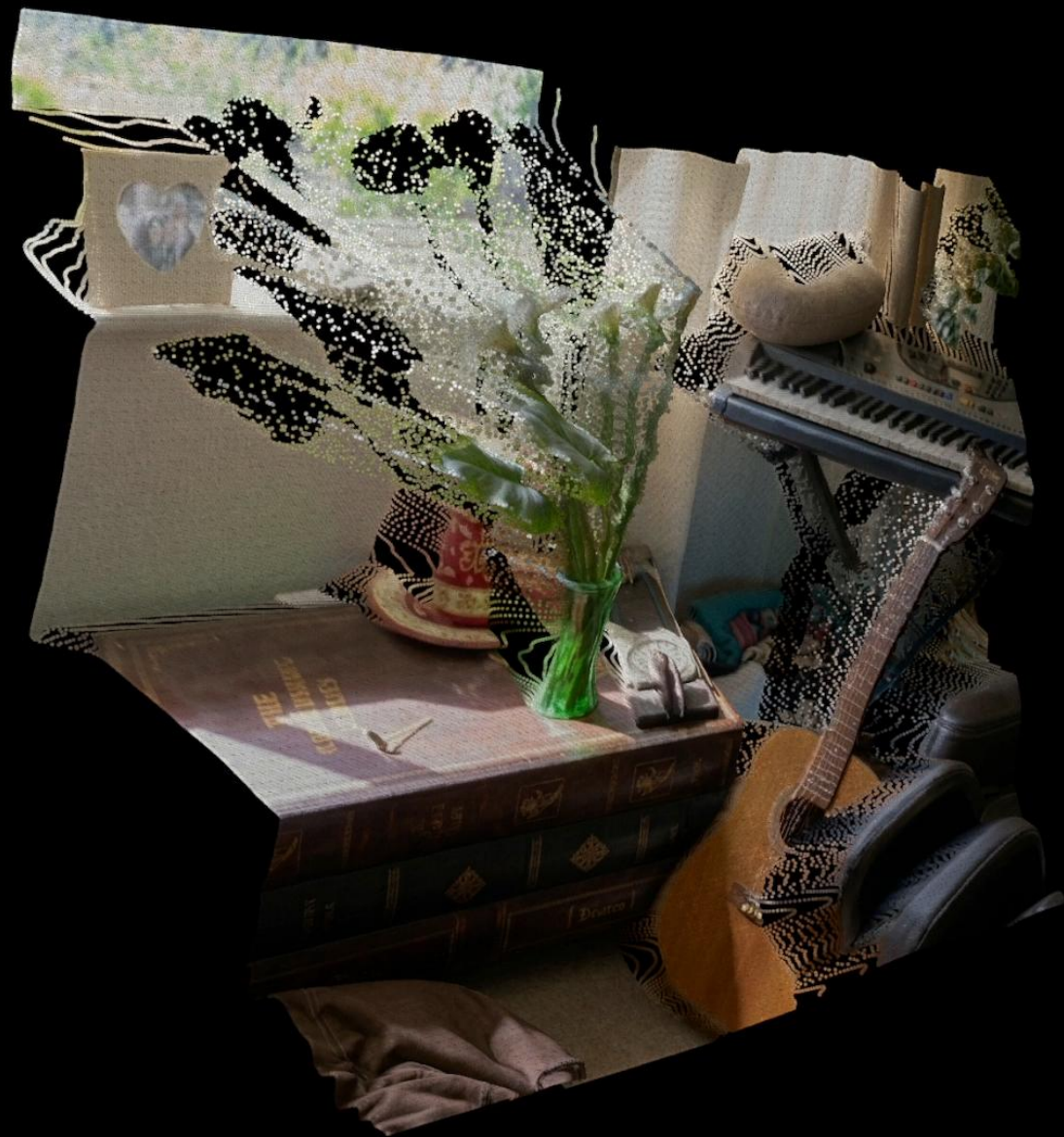
**MONOCULAR
3D PIPELINE^[3]**

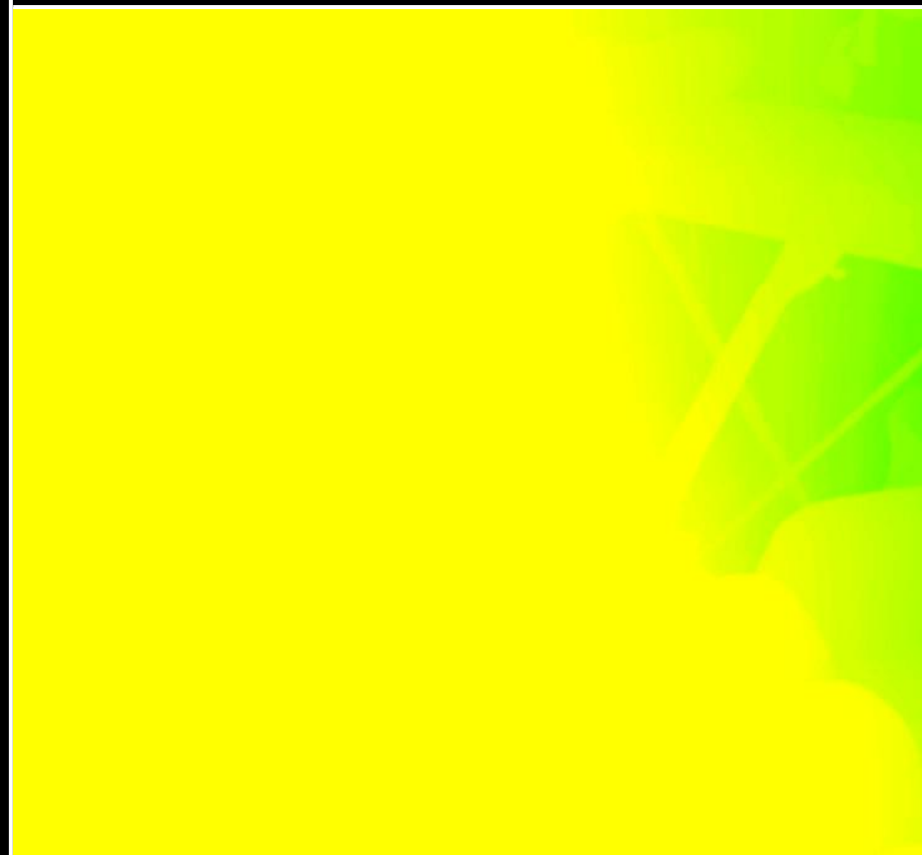
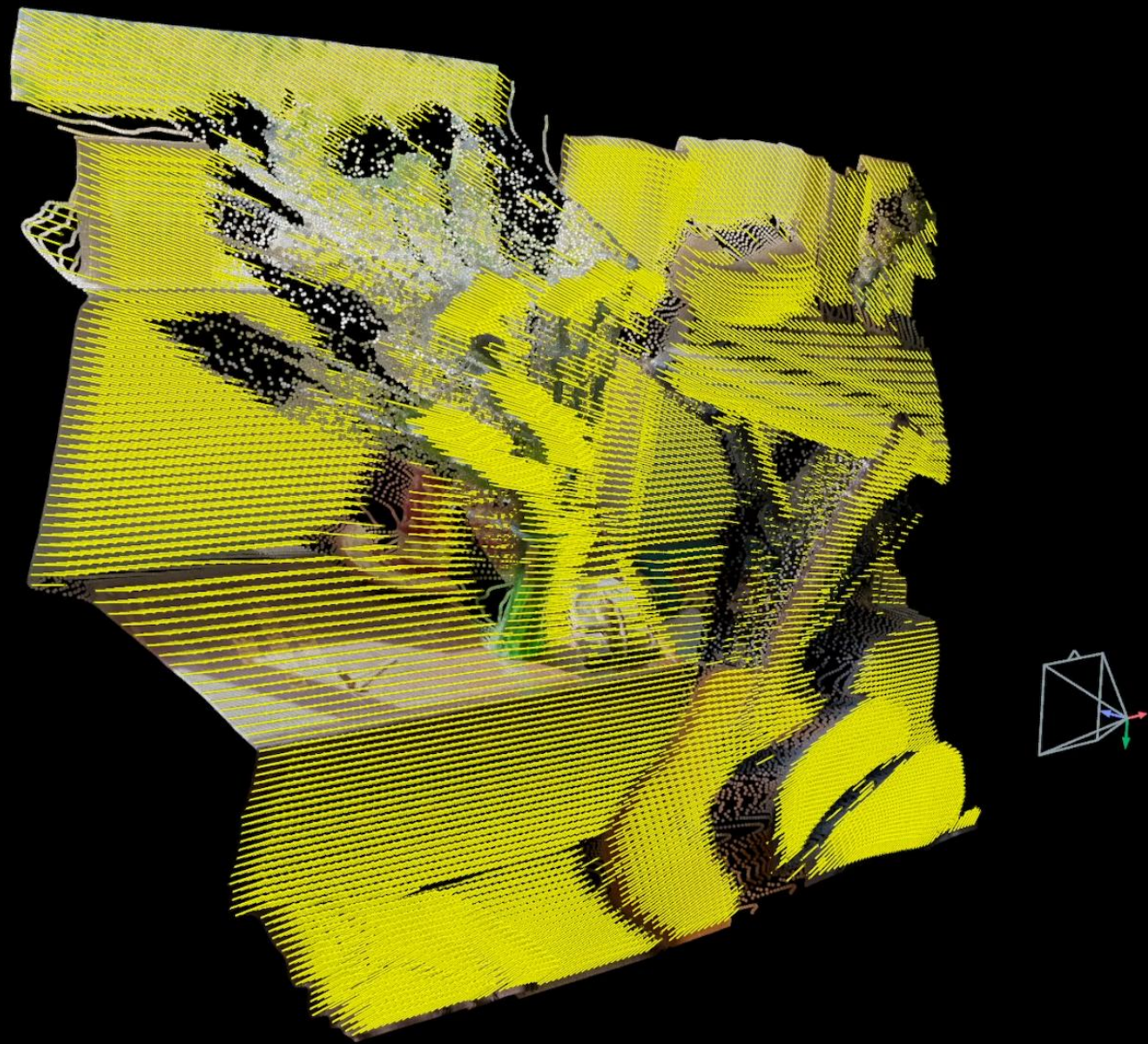


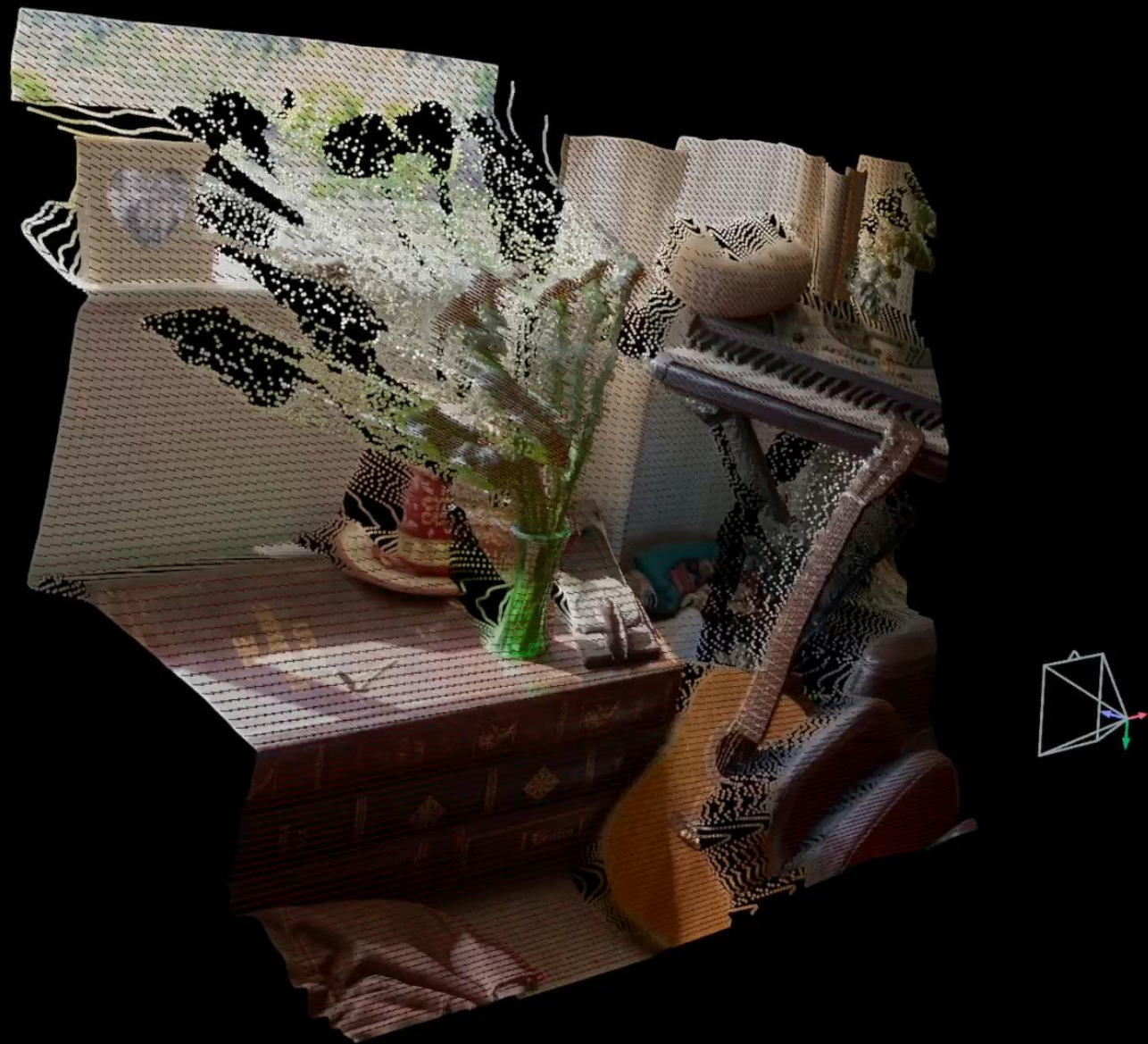
[3] WANG, NEURIPS 2025







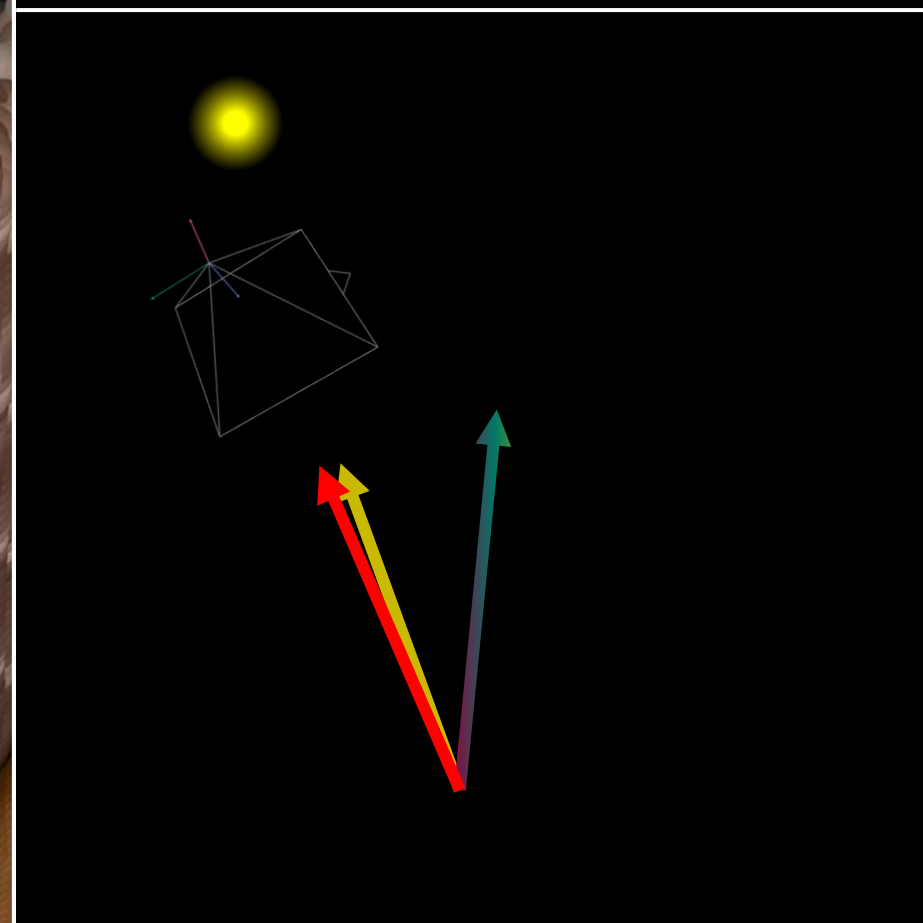








HIGHLIGHT GENERATION ALGEBRA

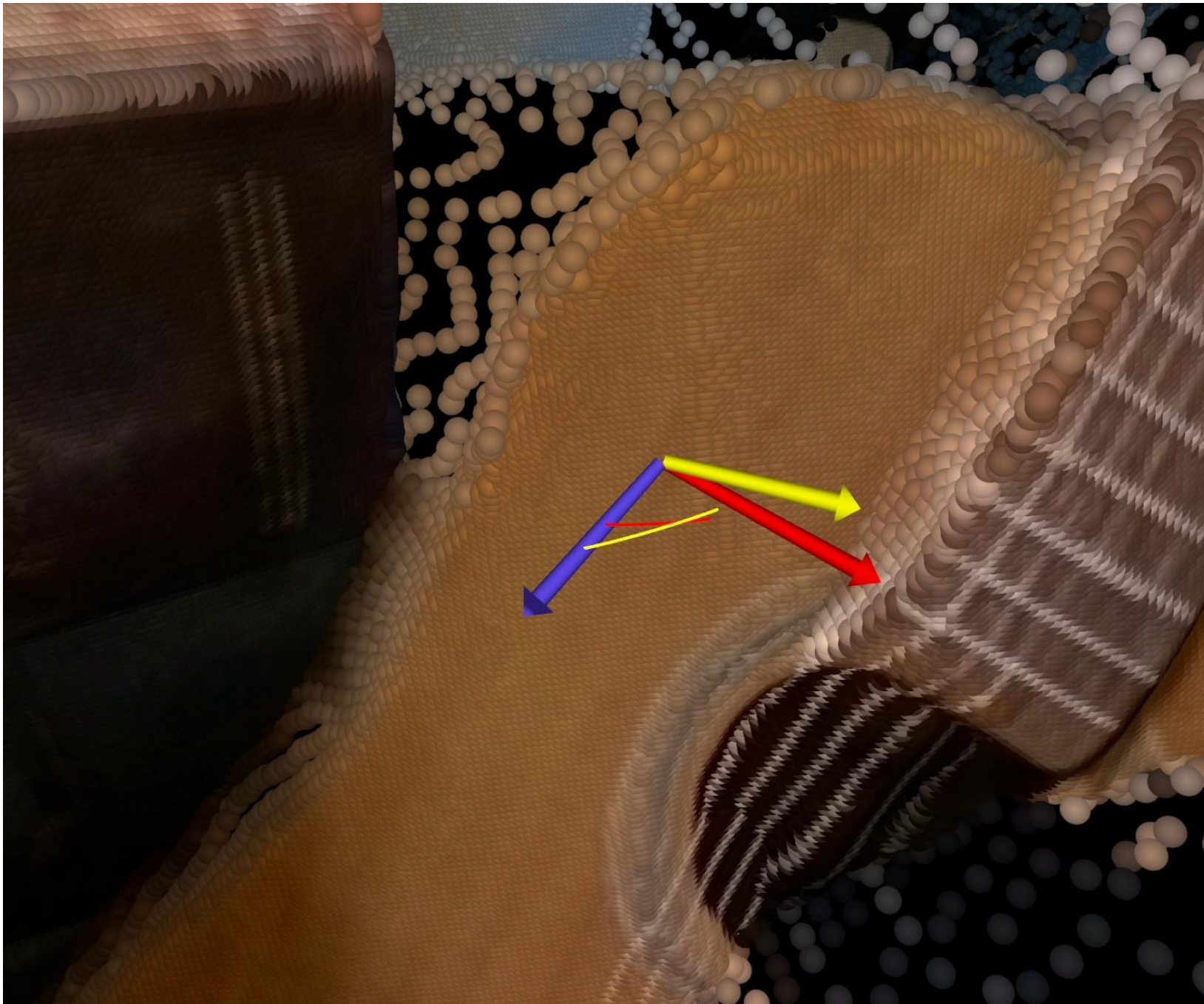


 **NORMAL VECTOR**

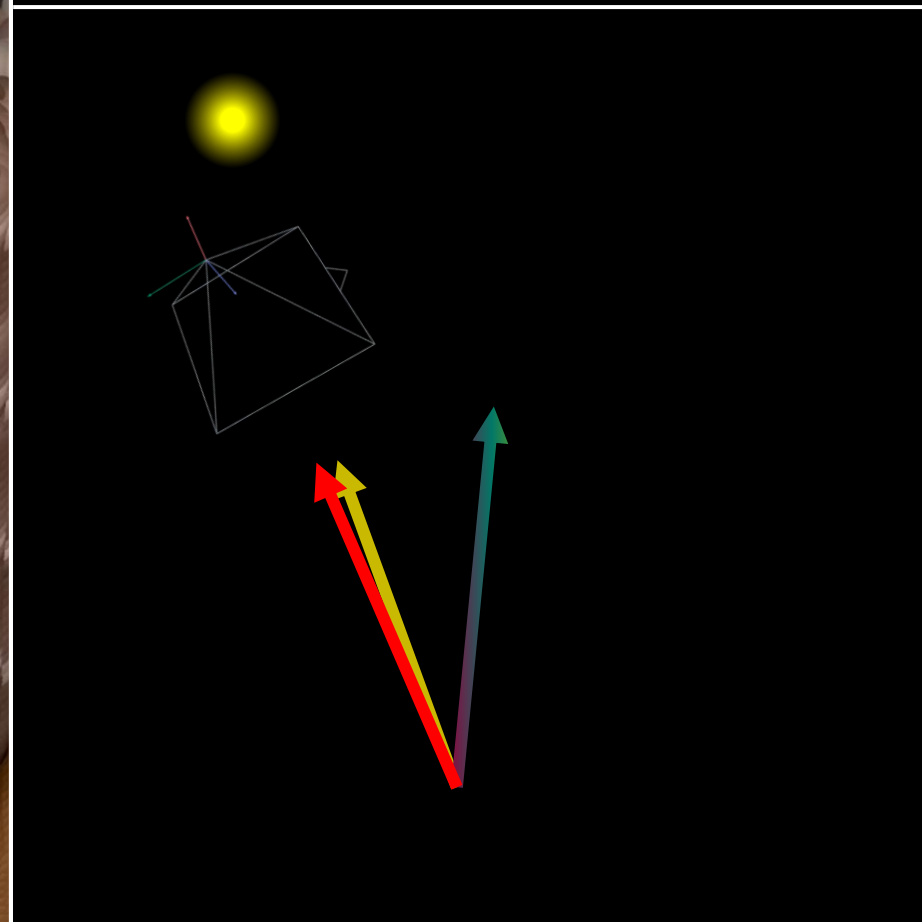
 **VIEWING RAY**

 **LIGHT RAY**



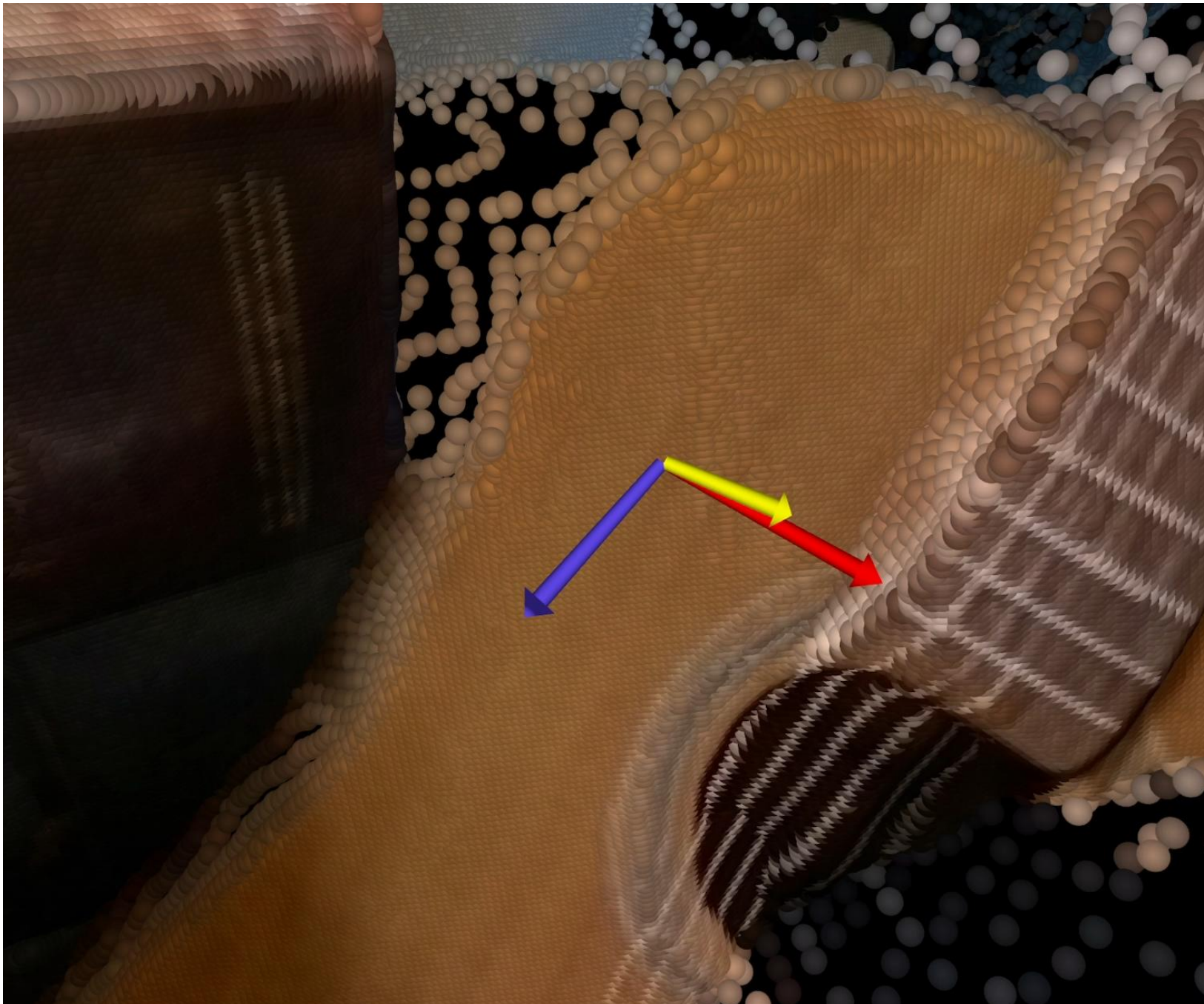


HIGHLIGHT GENERATION ALGEBRA

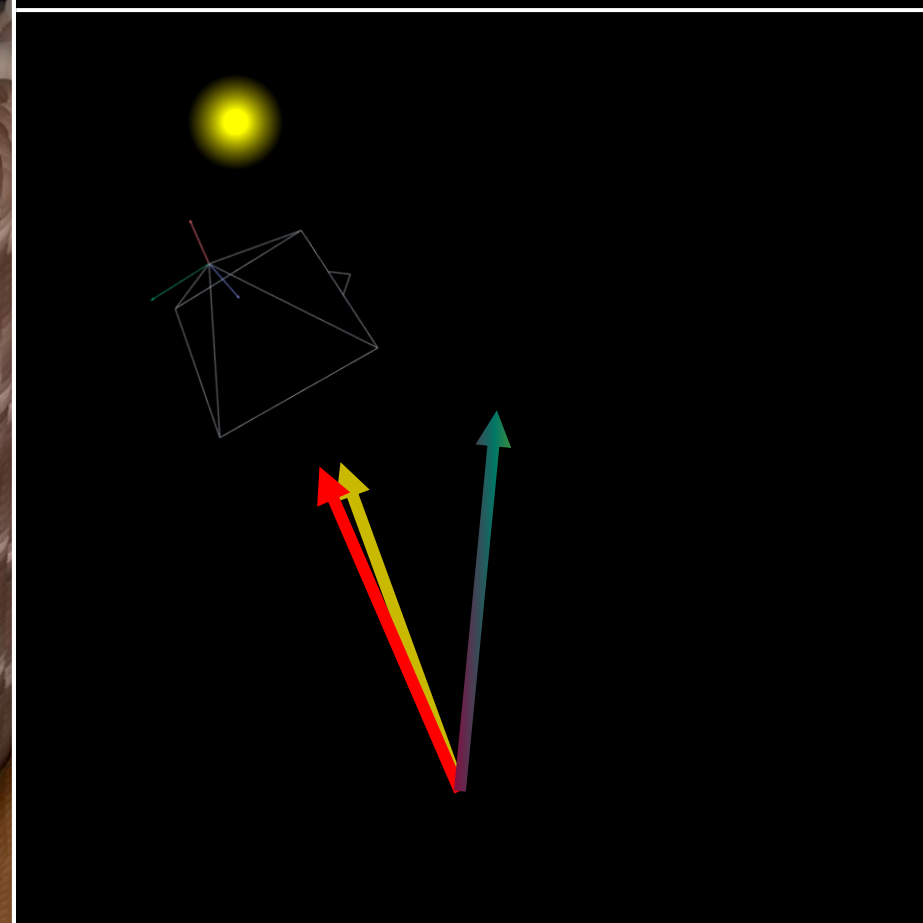


-  **N**ORMAL VECTOR
-  **V**IEWING RAY
-  **L**IGHT RAY





HIGHLIGHT GENERATION ALGEBRA

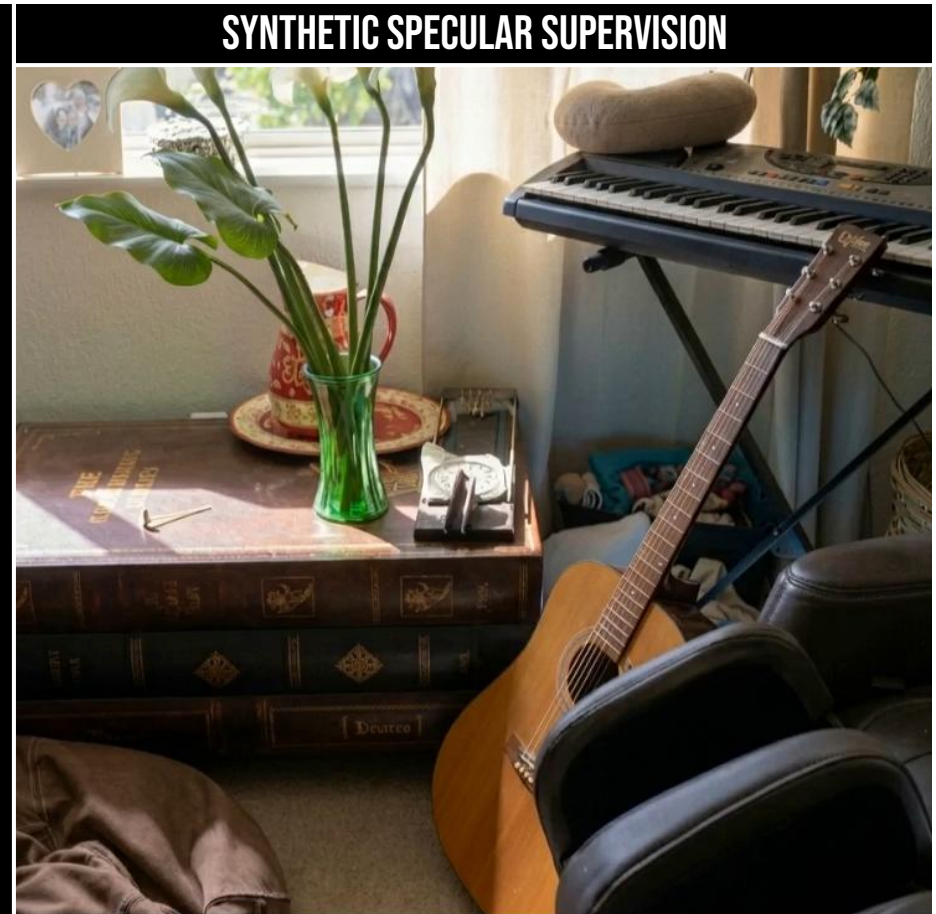
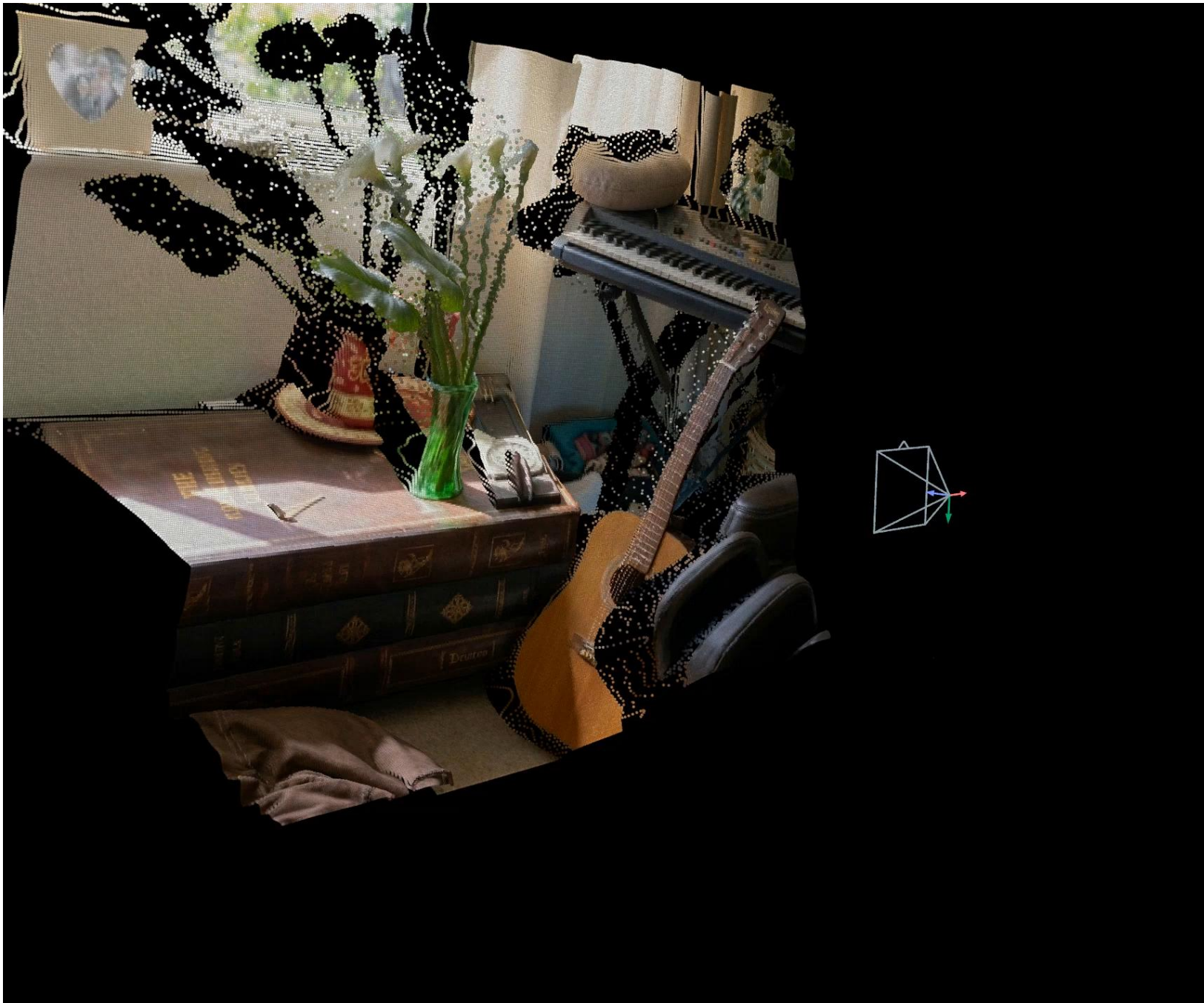


 **NORMAL VECTOR**

 **VIEWING RAY**

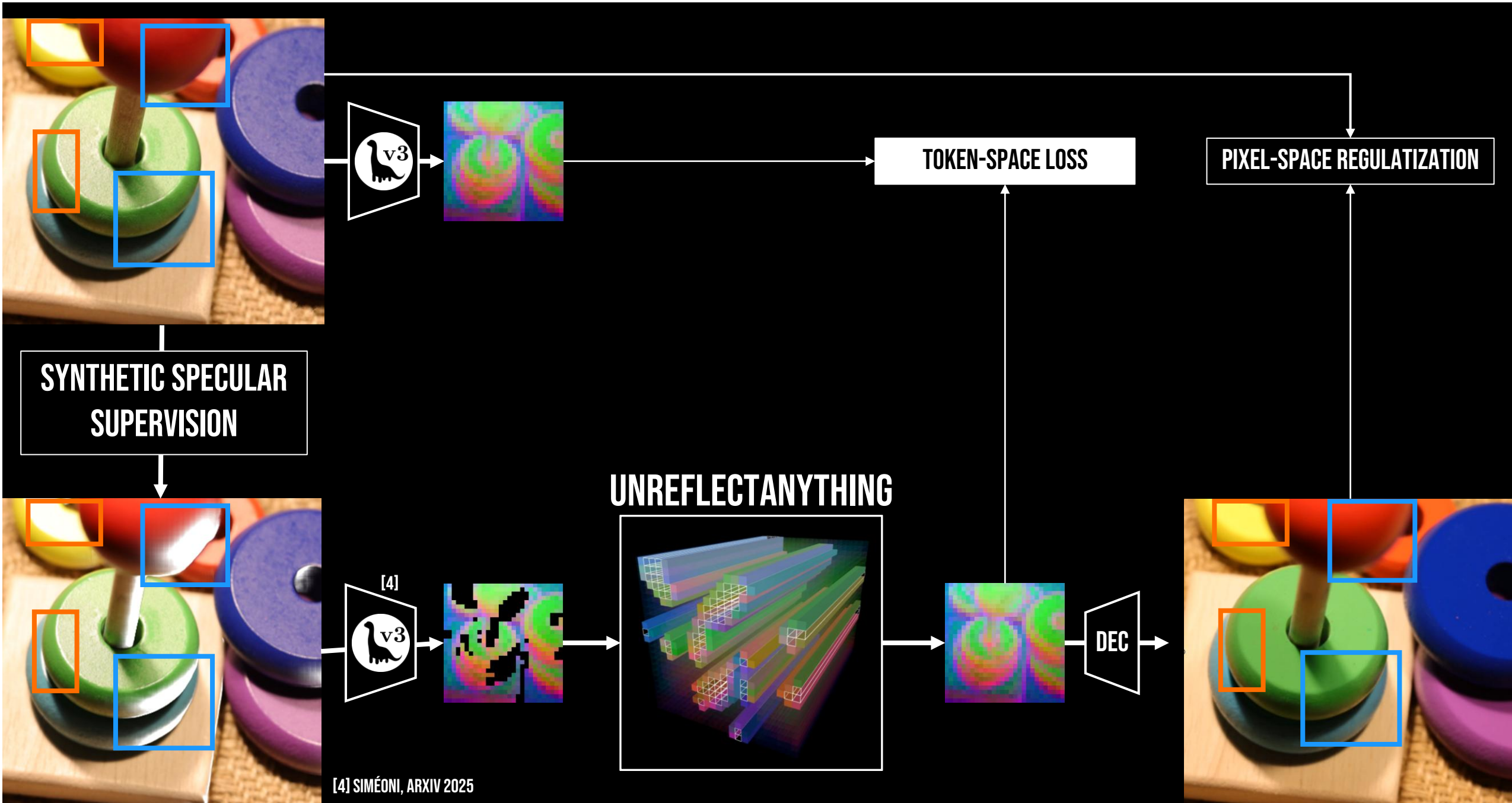
 **LIGHT RAY**

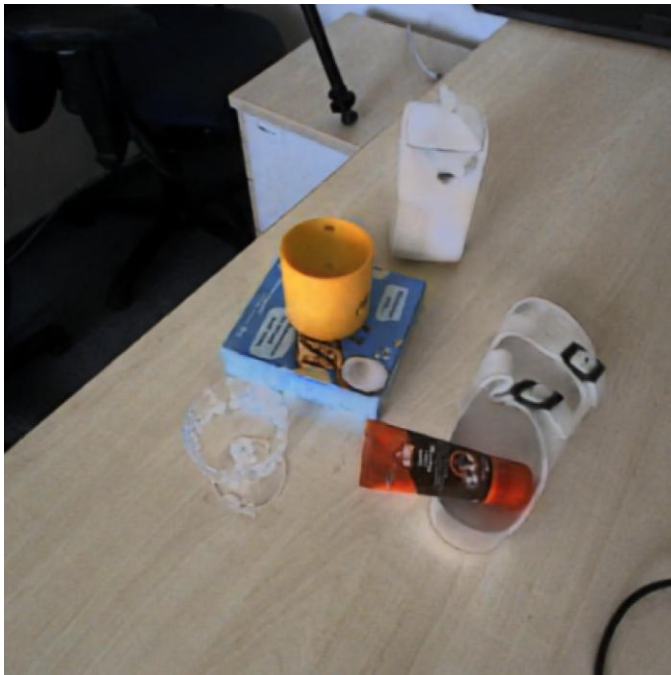




SYNTHETIC SPECULAR SUPERVISION





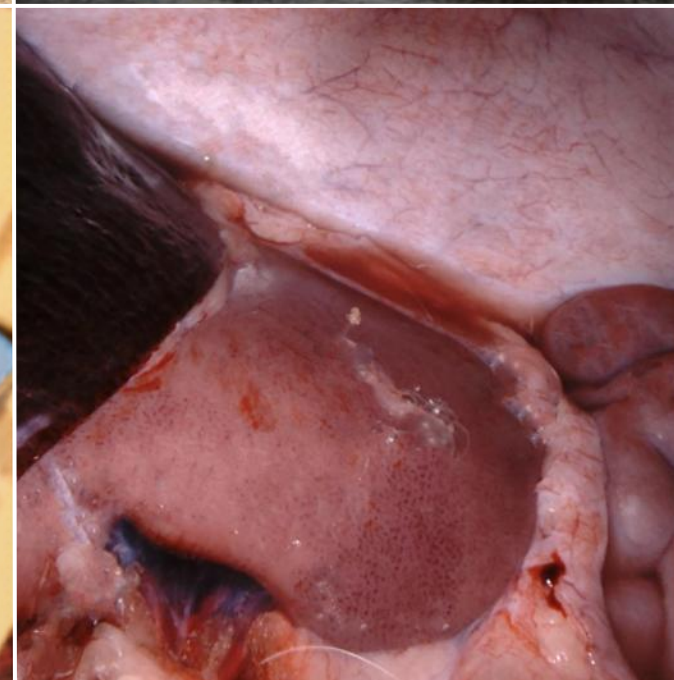


TRAINING TIME

COMPOSITE

SOME

SYNTHETIC
HIGHLIGHTS



INFERENCE TIME

REMOVE

ALL

HIGHLIGHTS



UNREFLECTANYTHING

MIT
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