

InFlux: A Benchmark for Self-Calibration of Dynamic Intrinsic of Video Cameras

Erich Liang, Roma Bhattacharjee*, Sreemanti Dey*,
Rafael Moschopoulos, Caitlin Wang, Michel Liao, Grace Tan, Andrew Wang,
Karhan Kayan, Stamatis Alexandropoulos, Jia Deng

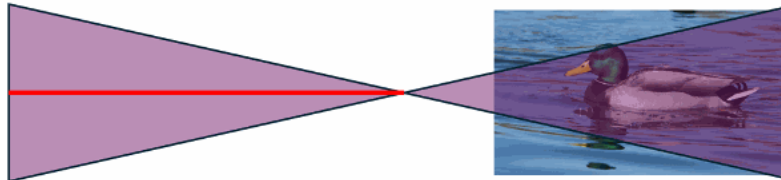
<https://influx.cs.princeton.edu/>

NeurIPS 2025 | Datasets and Benchmarks Track

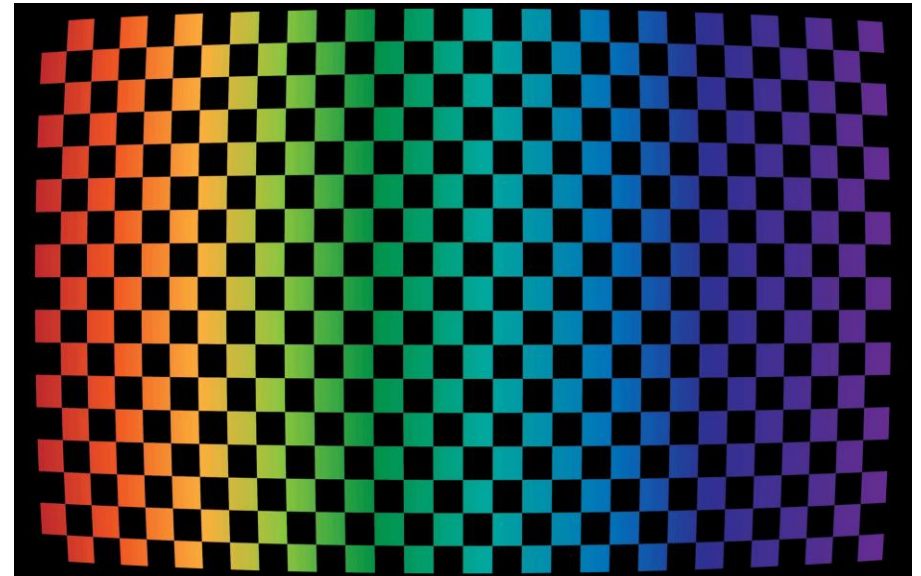
Camera Intrinsics: Vital for 3D Understanding

- Models how 3D geometry appears in 2D images
- Two components: intrinsics matrix + lens distortion

Intrinsics Matrix Parameters



Lens Distortion Parameters



Current Benchmarks have Constant Intrinsic



Turn on your speakers!

In-the-Wild Videos have Dynamic Intrinsic



Goal: Dynamic Intrinsic w/ Per-Frame Labels

Dynamic Intrinsic Videos



Per-Frame Intrinsic Labels

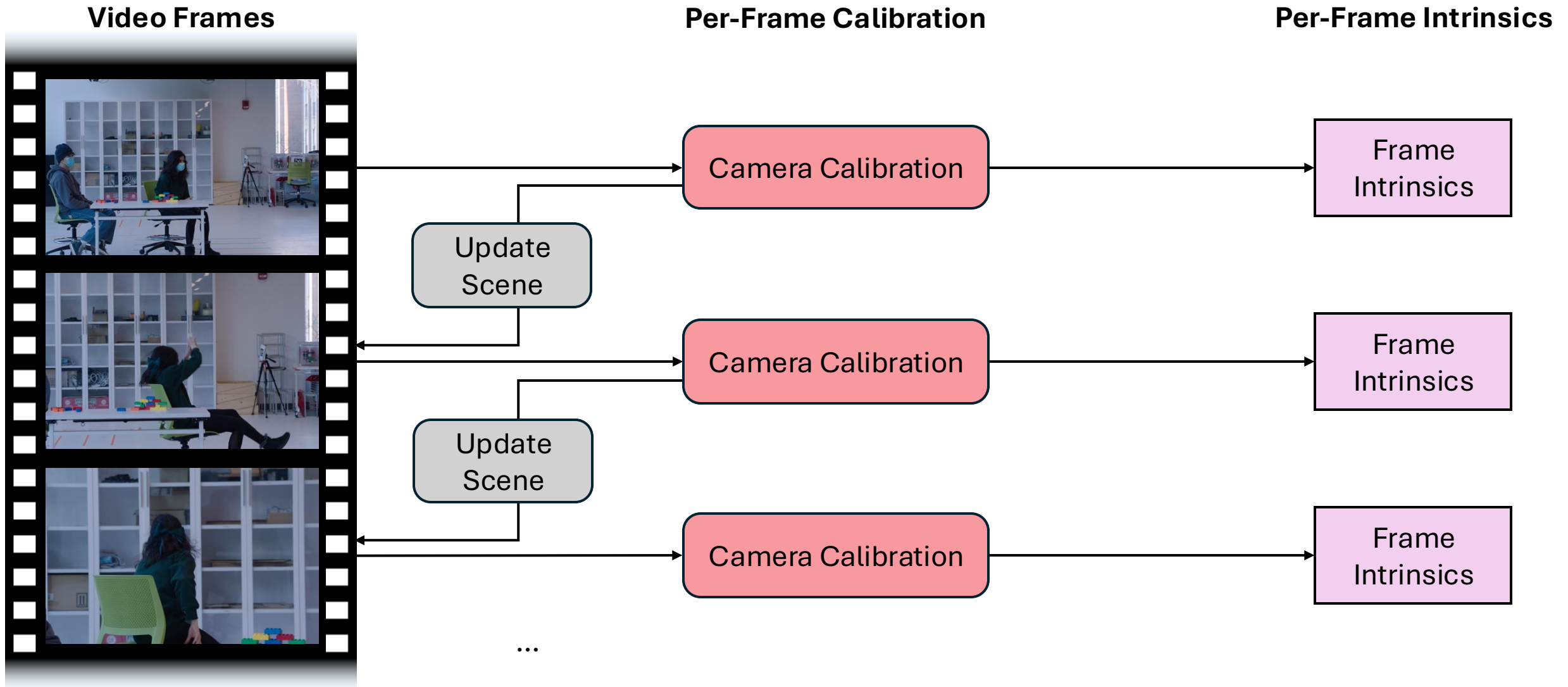
Frame 0: $[f_x, f_y, c_x, c_y, k_1, k_2, p_1, p_2]$

Frame 1: $[f_x, f_y, c_x, c_y, k_1, k_2, p_1, p_2]$

...

Frame N: $[f_x, f_y, c_x, c_y, k_1, k_2, p_1, p_2]$

Naïve Approach: Per-Frame Recalibration

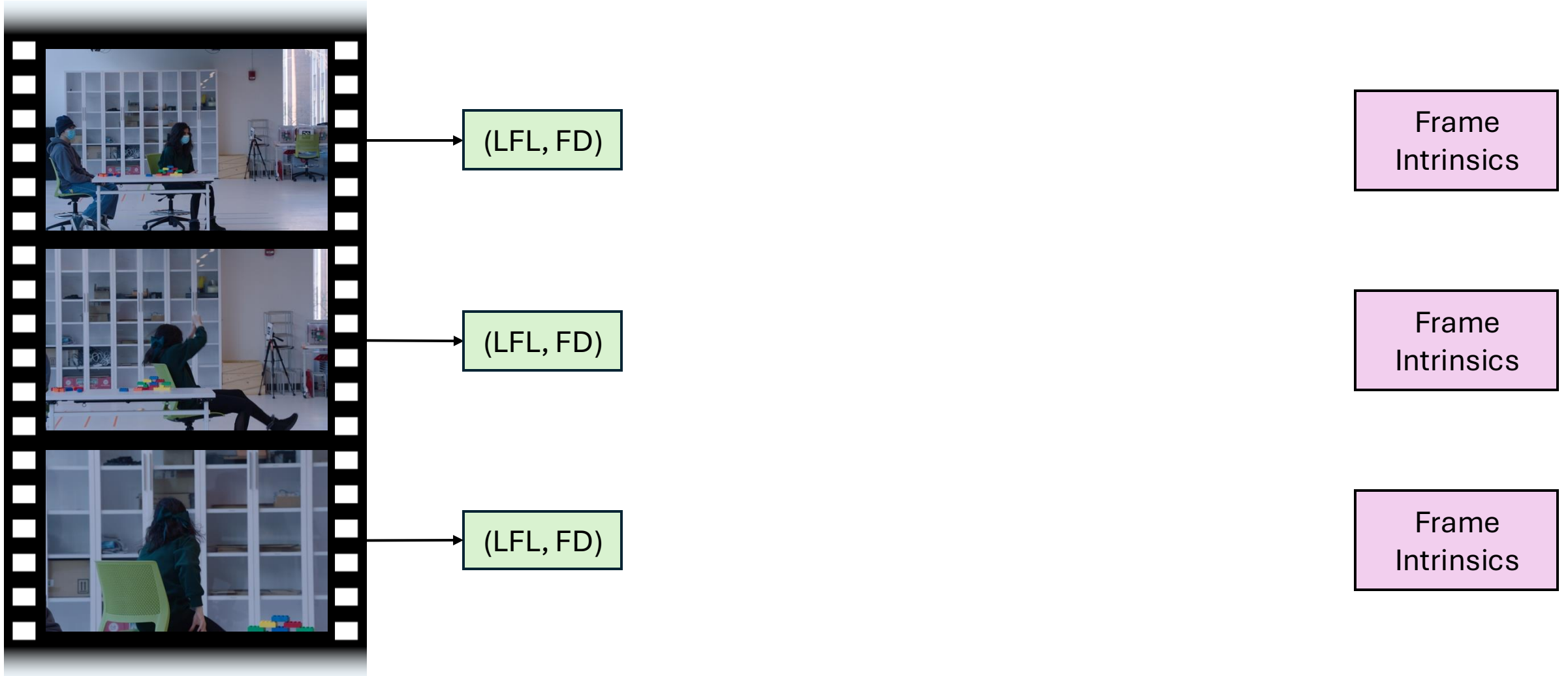


Look-Up Table (LUT) Approach

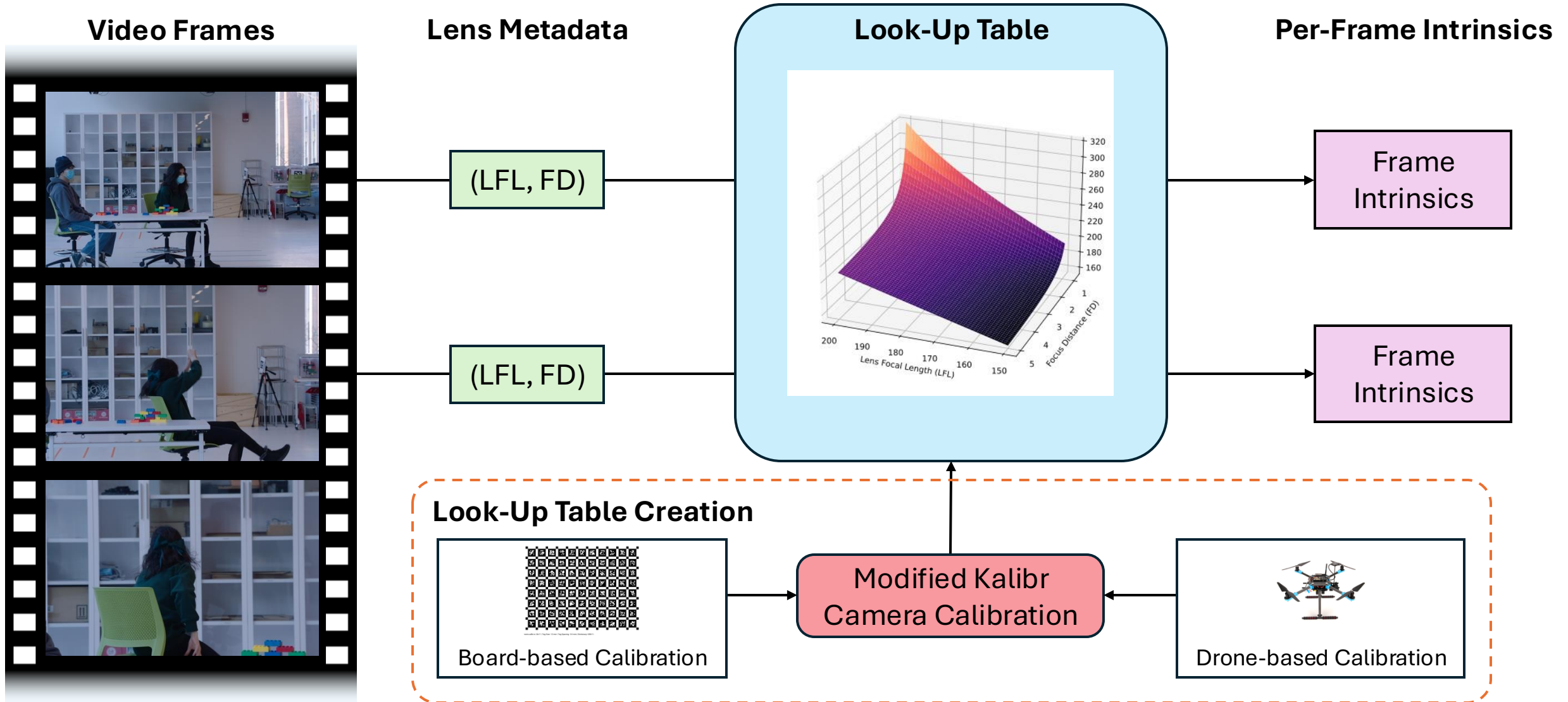
Video Frames

Lens Metadata

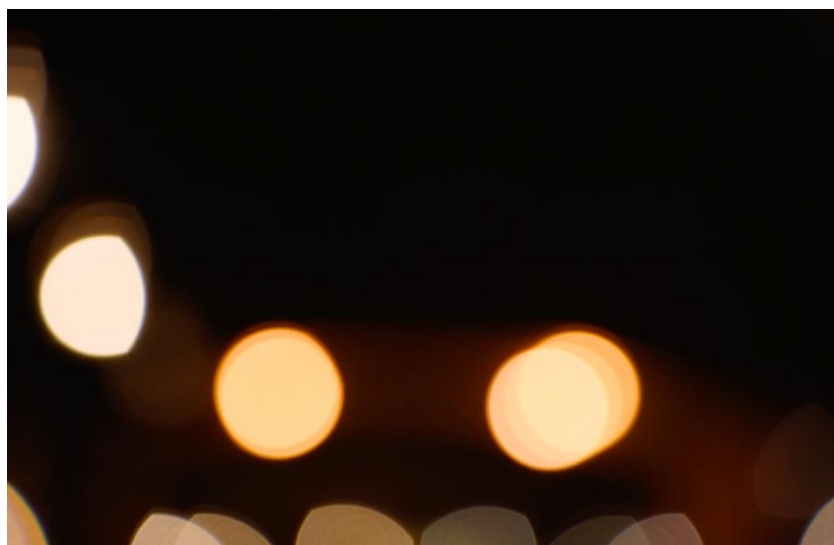
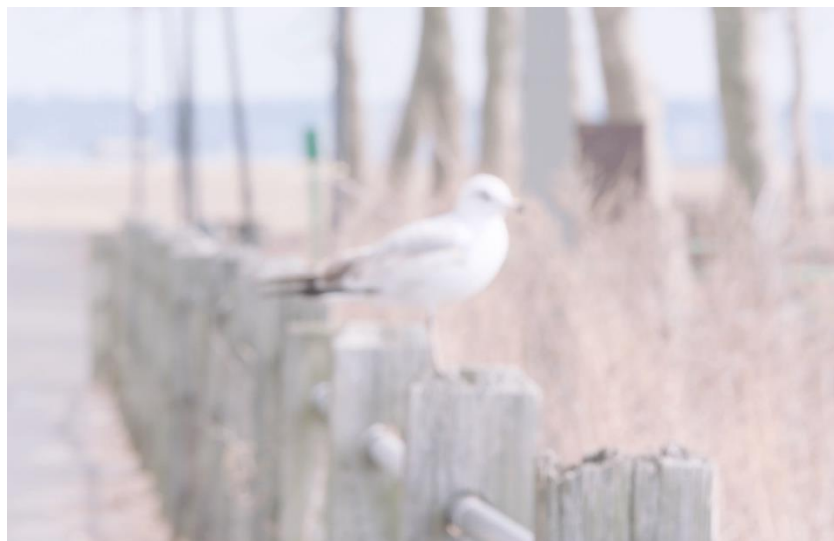
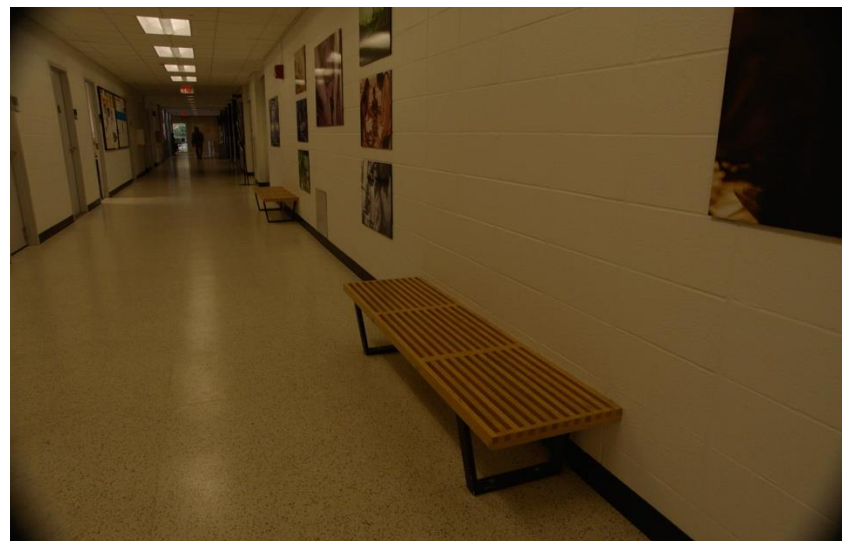
Per-Frame Intrinsic



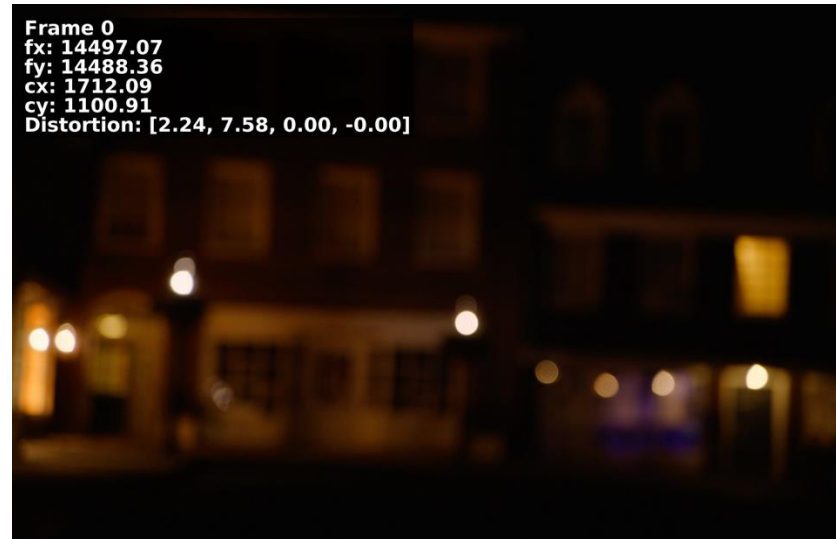
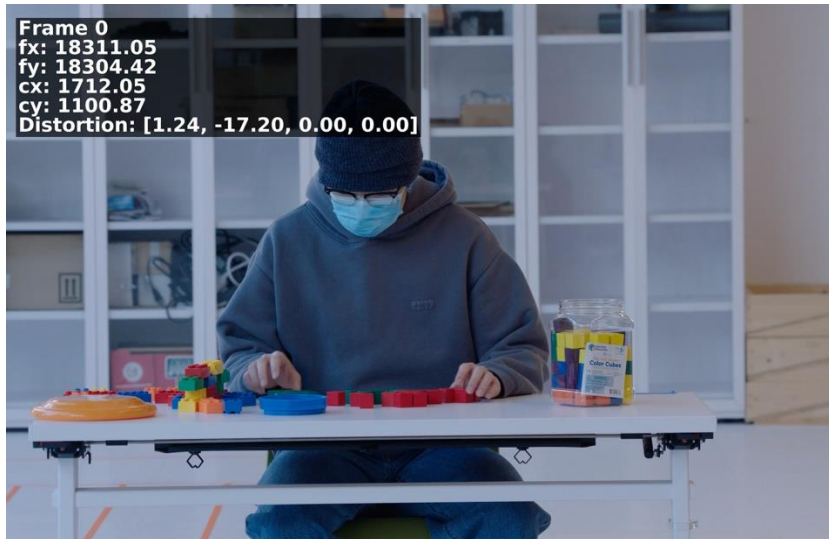
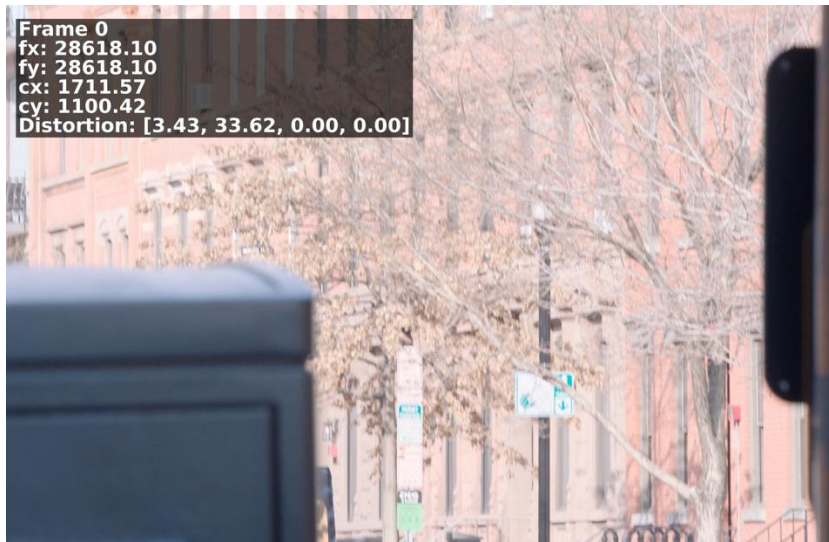
InFlux Approach



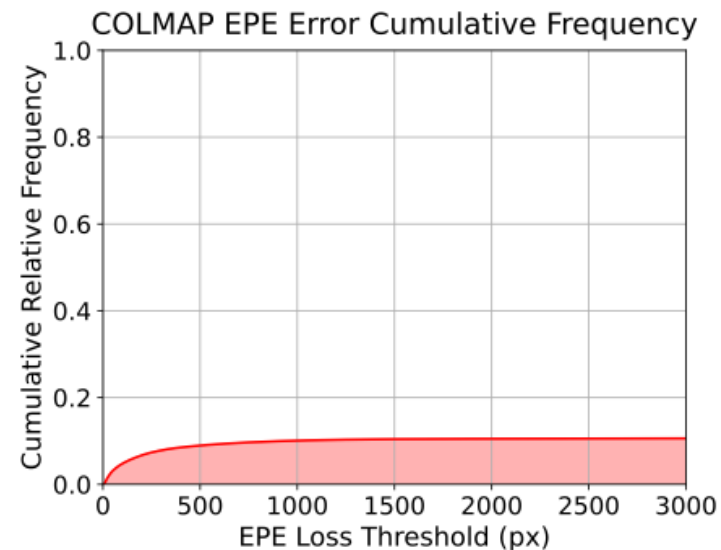
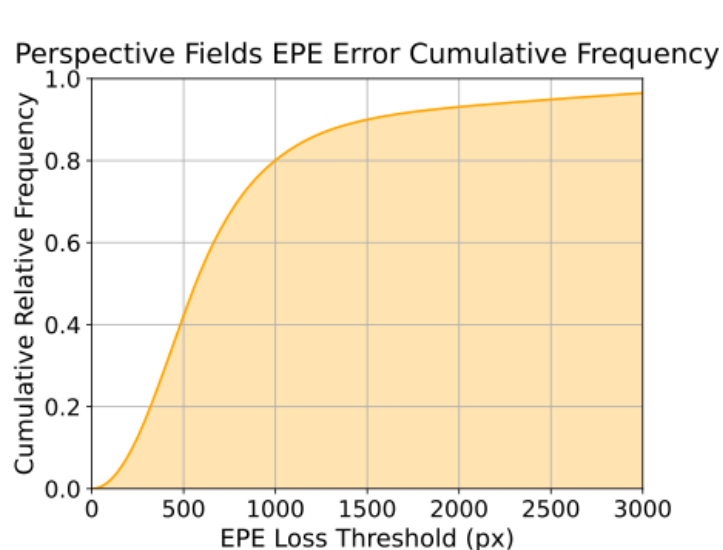
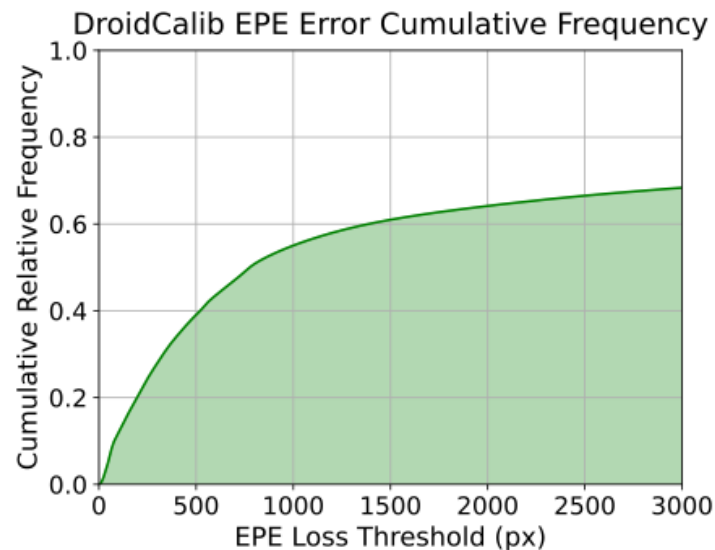
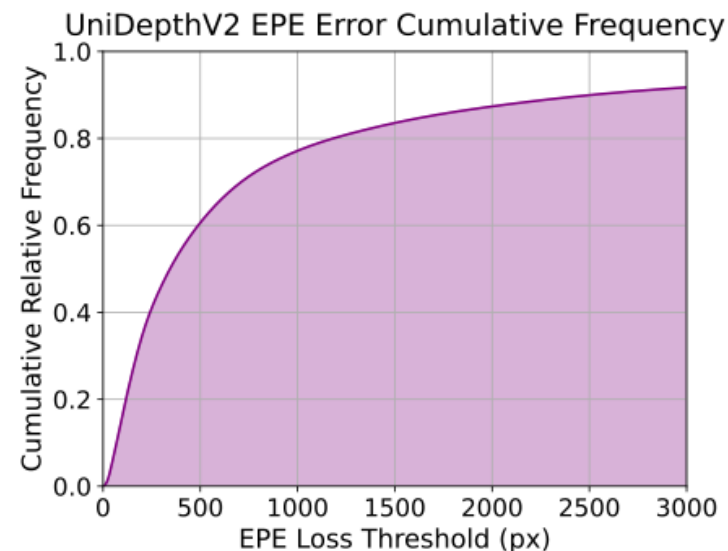
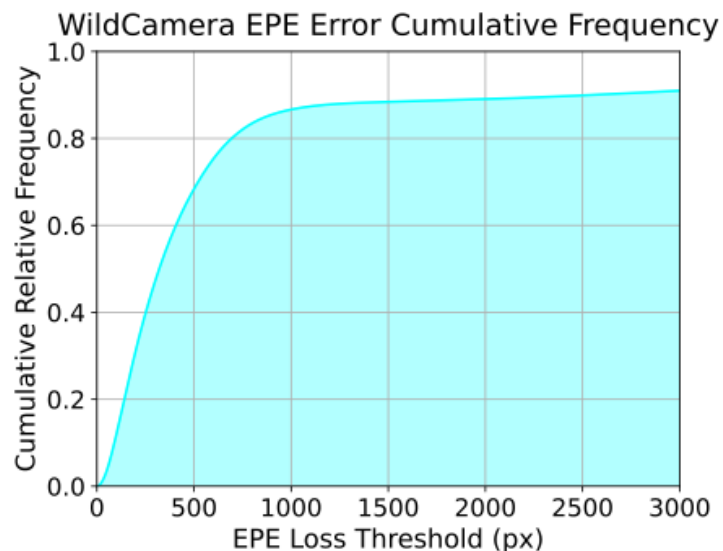
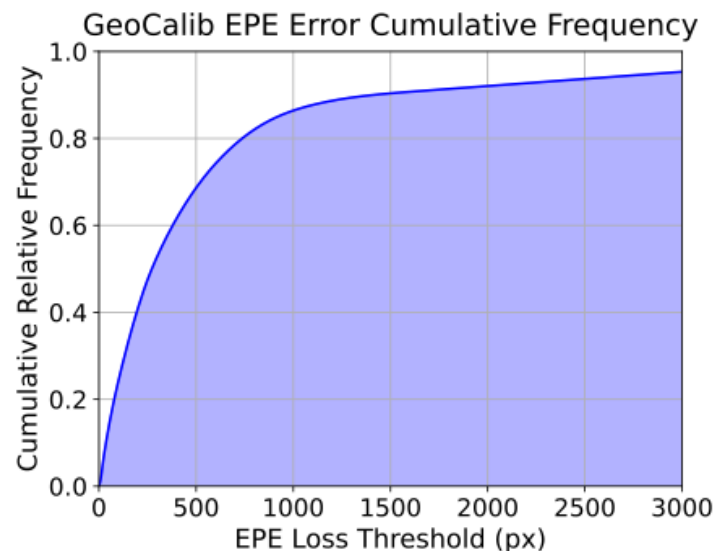
Gallery of InFlux Videos



Annotated Videos



Evaluation of Baseline Methods



Thank you!

For more results, released code and data, and the submission portal, visit:

<https://influx.cs.princeton.edu/>

