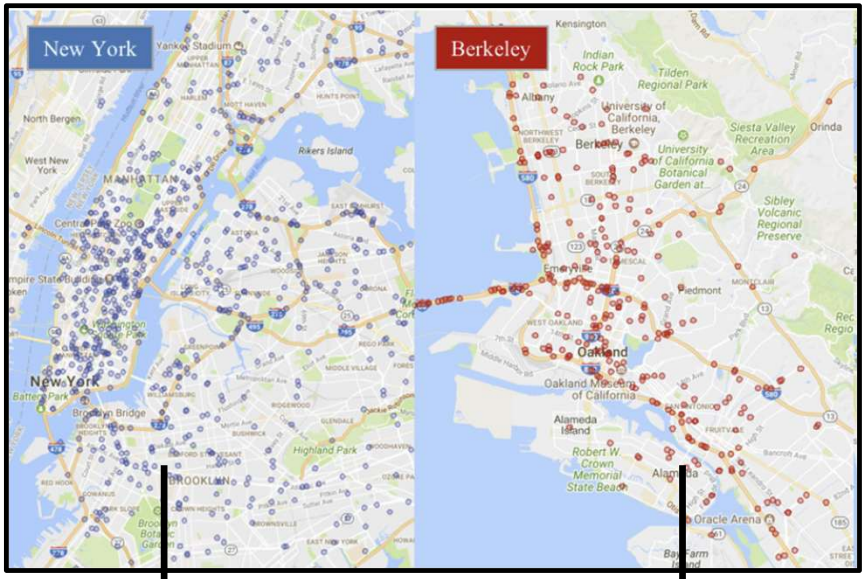
# Week 9 Progress Report

## Generative Satellite Alignment for Cross-View Geolocalization

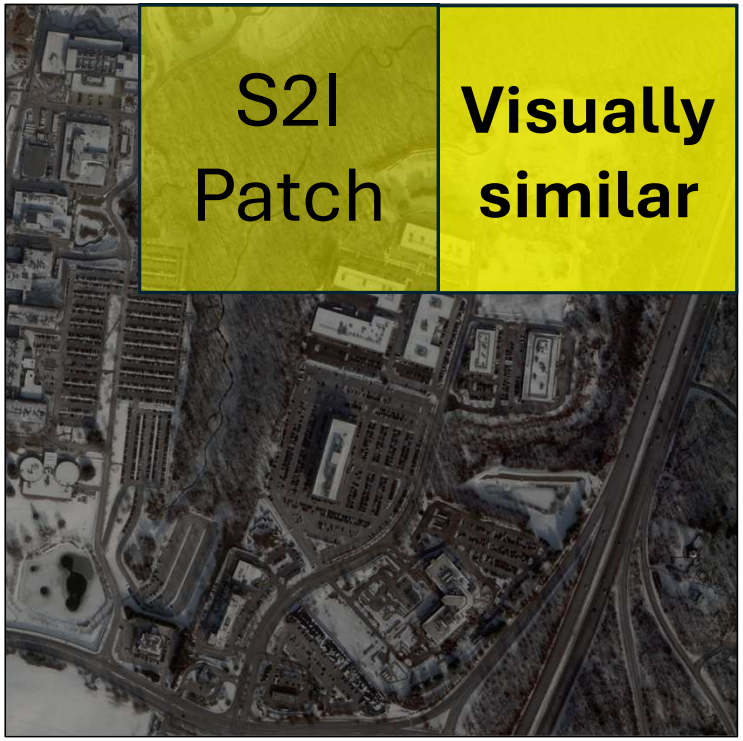
**Student**: Wyatt Petula  **Mentors**: Soumik Ghosh, Qingyang Liu

**-- Connecting GAReT to X-VGGT --**

# GeoAdapter was trained on easier negatives than what the challenge adaptation offers




*GAMa Dataset*




Reference Image

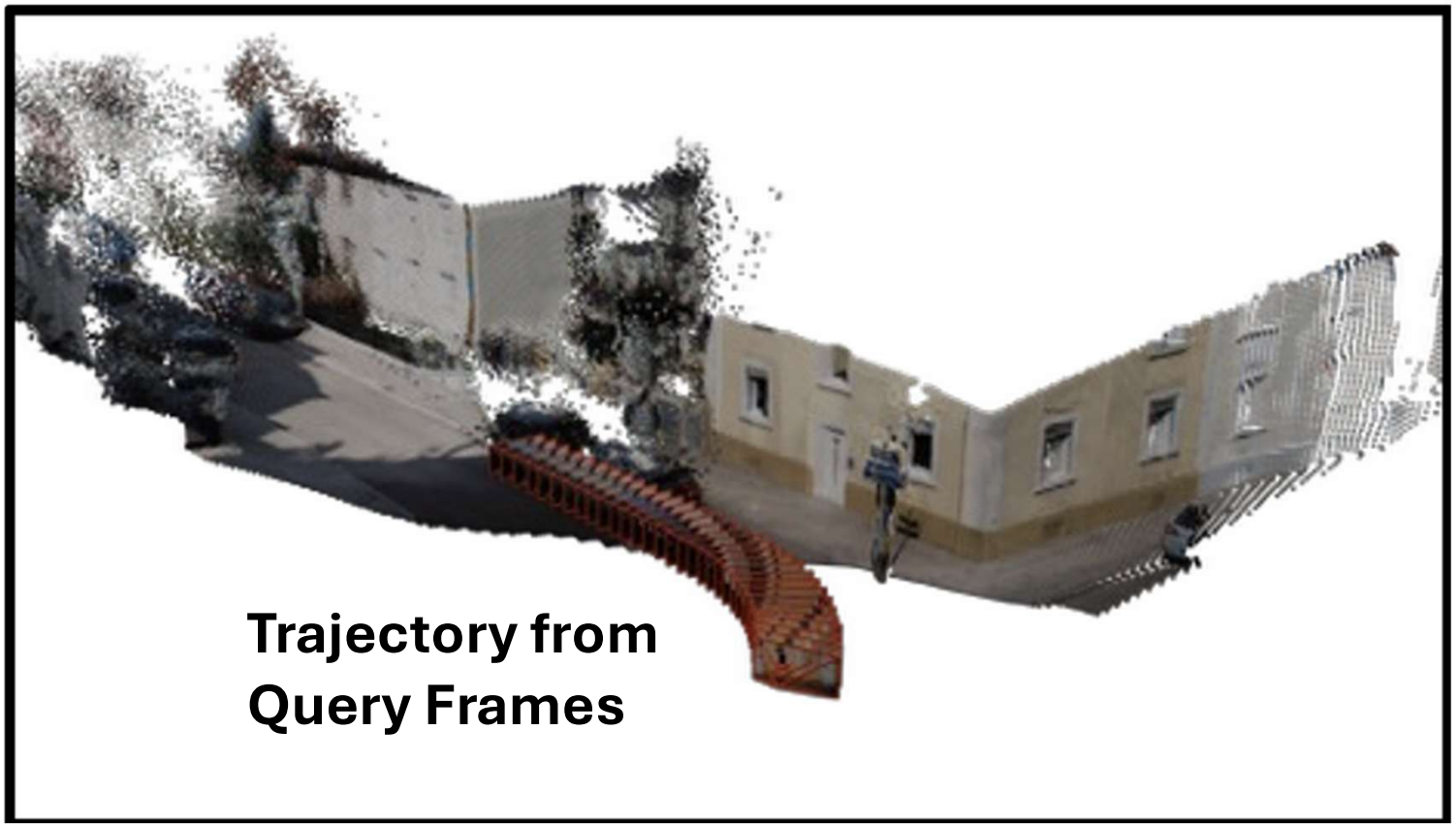
*WRIVA Challenge*

Coarse retrieval, and thus GeoAdapter, are obsolete for the challenge dataset



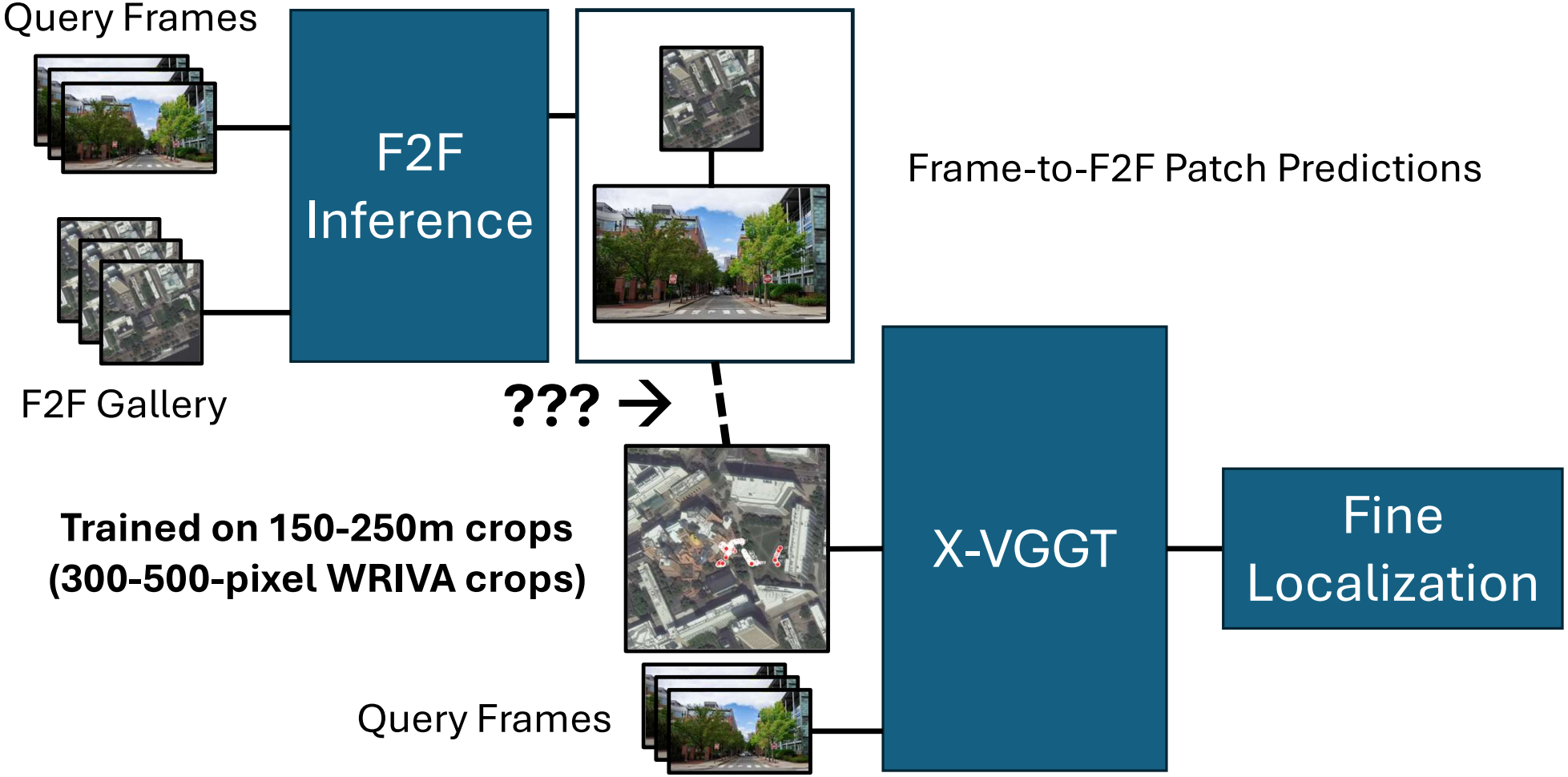


# Since X-VGGT substitutes TransRetriever, we only need the image encoders

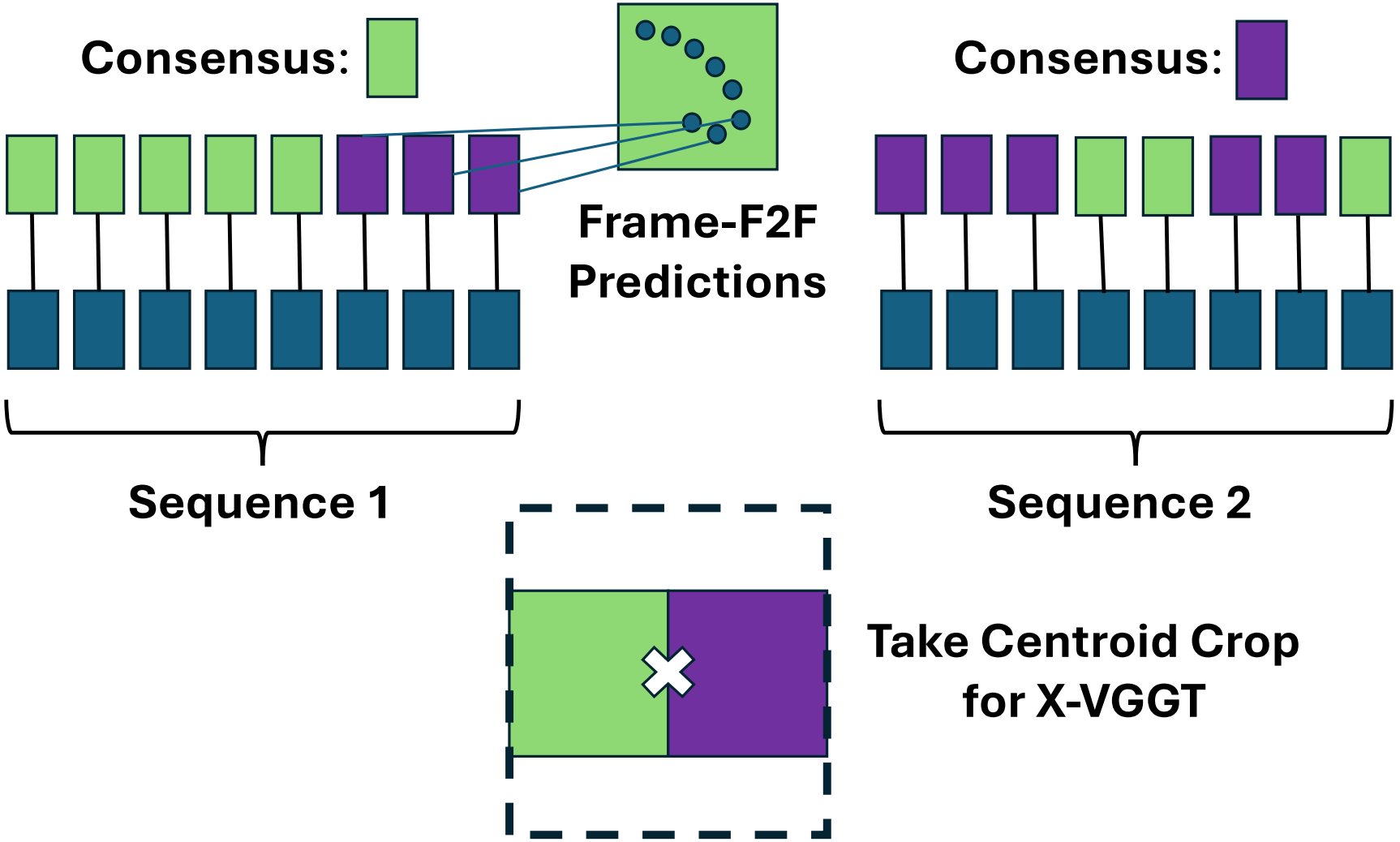



**Taken from** Georeferenced Cross-View 3D Reconstruction from Ground and Satellite Images (preprint)

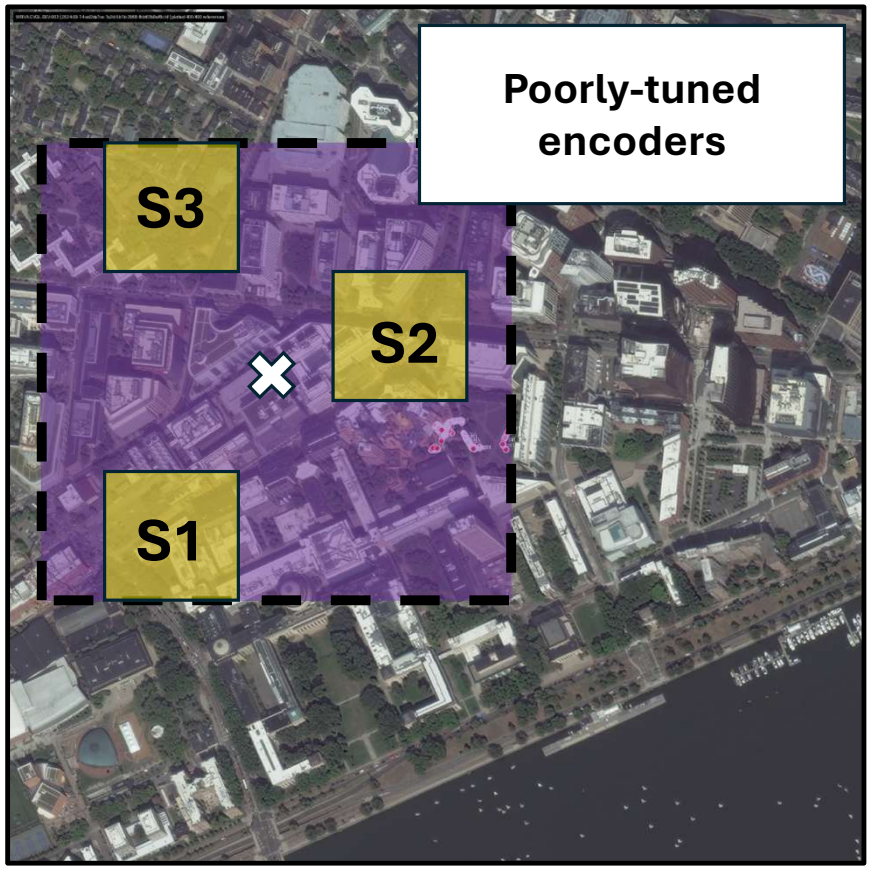
# Connecting fine-tuned GAReT to X-VGGT

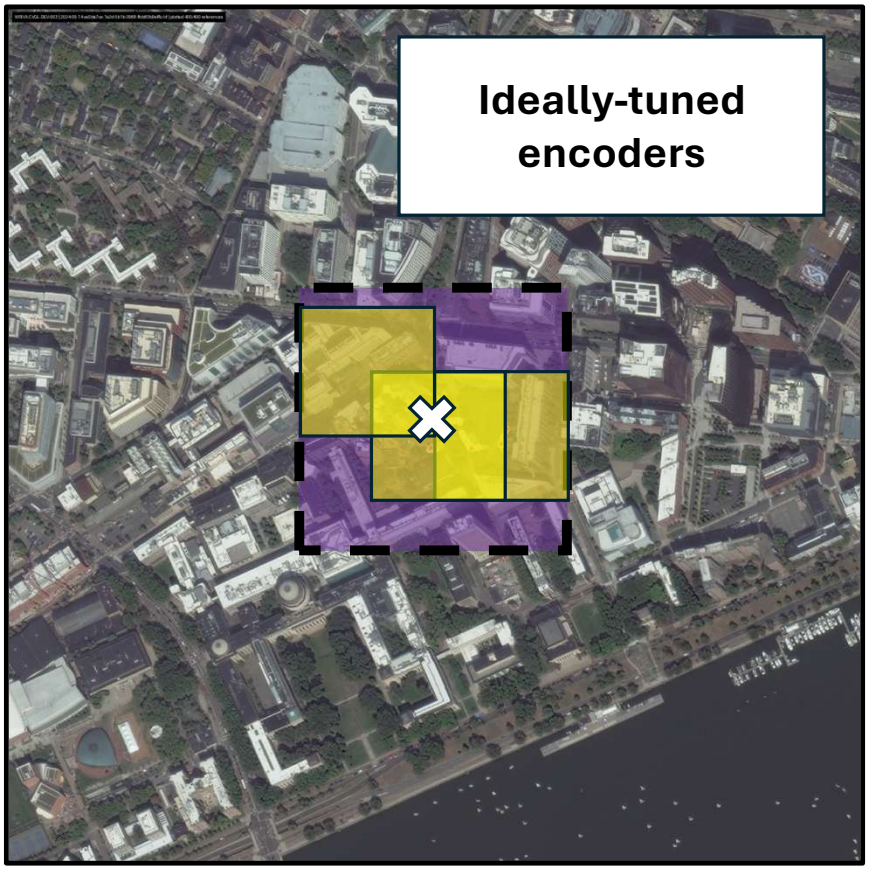


# Using consensus voting to obtain crops for X-VGGT

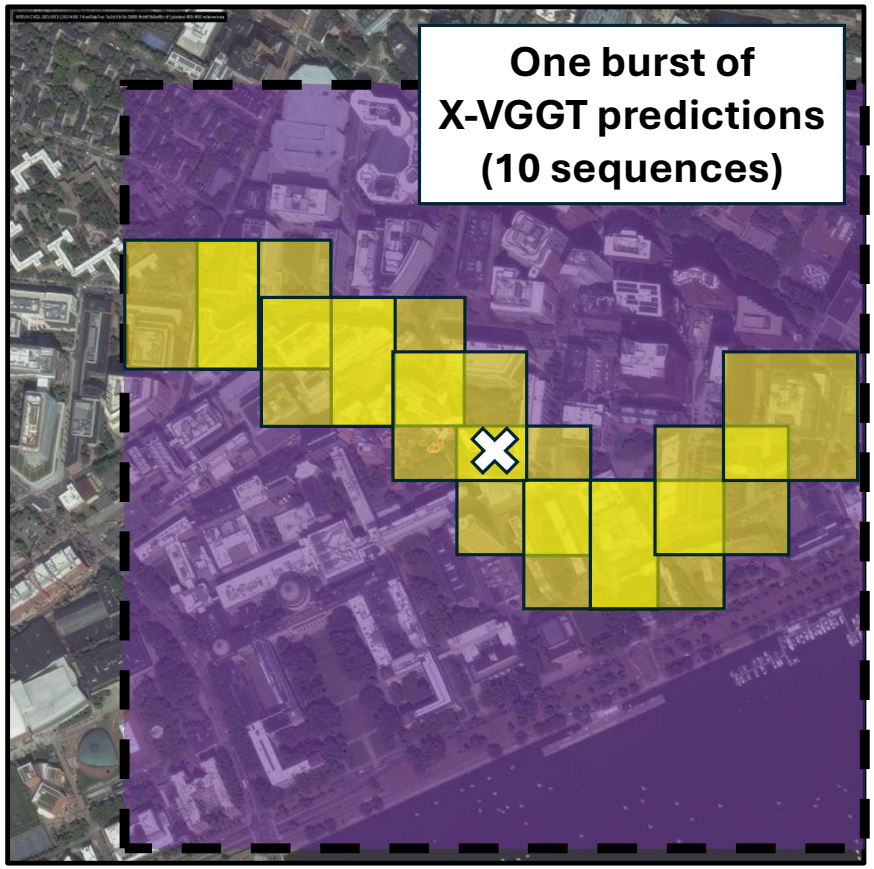


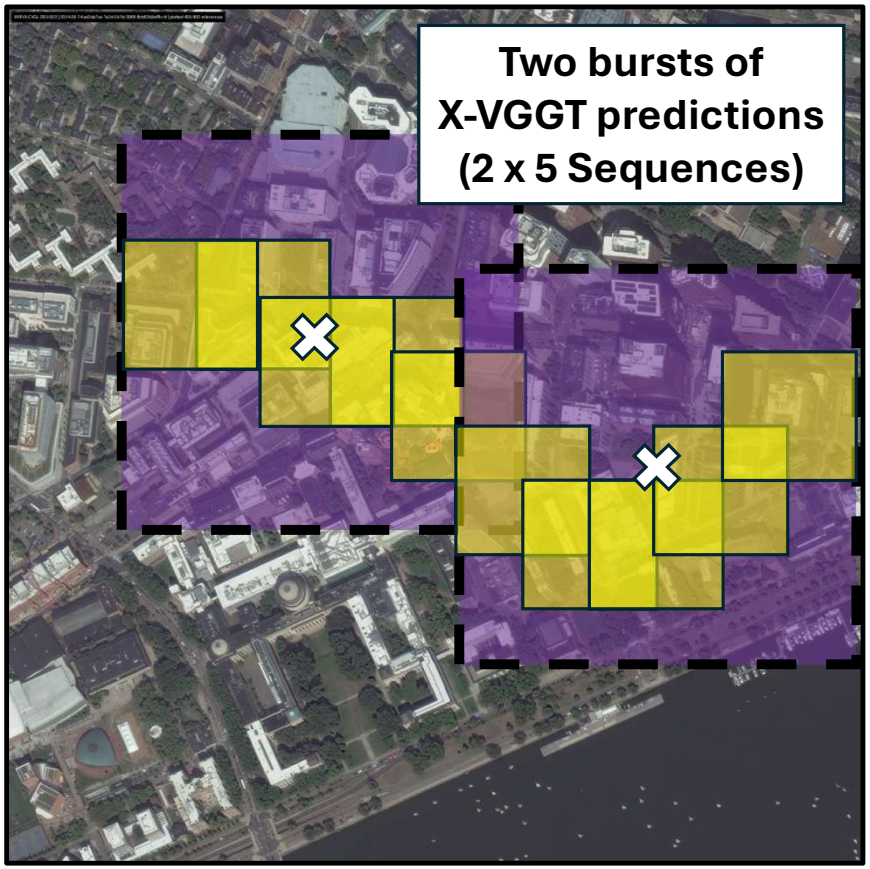
# Ideally-tuned image encoders will prevent noisy predictions and large centroid crops



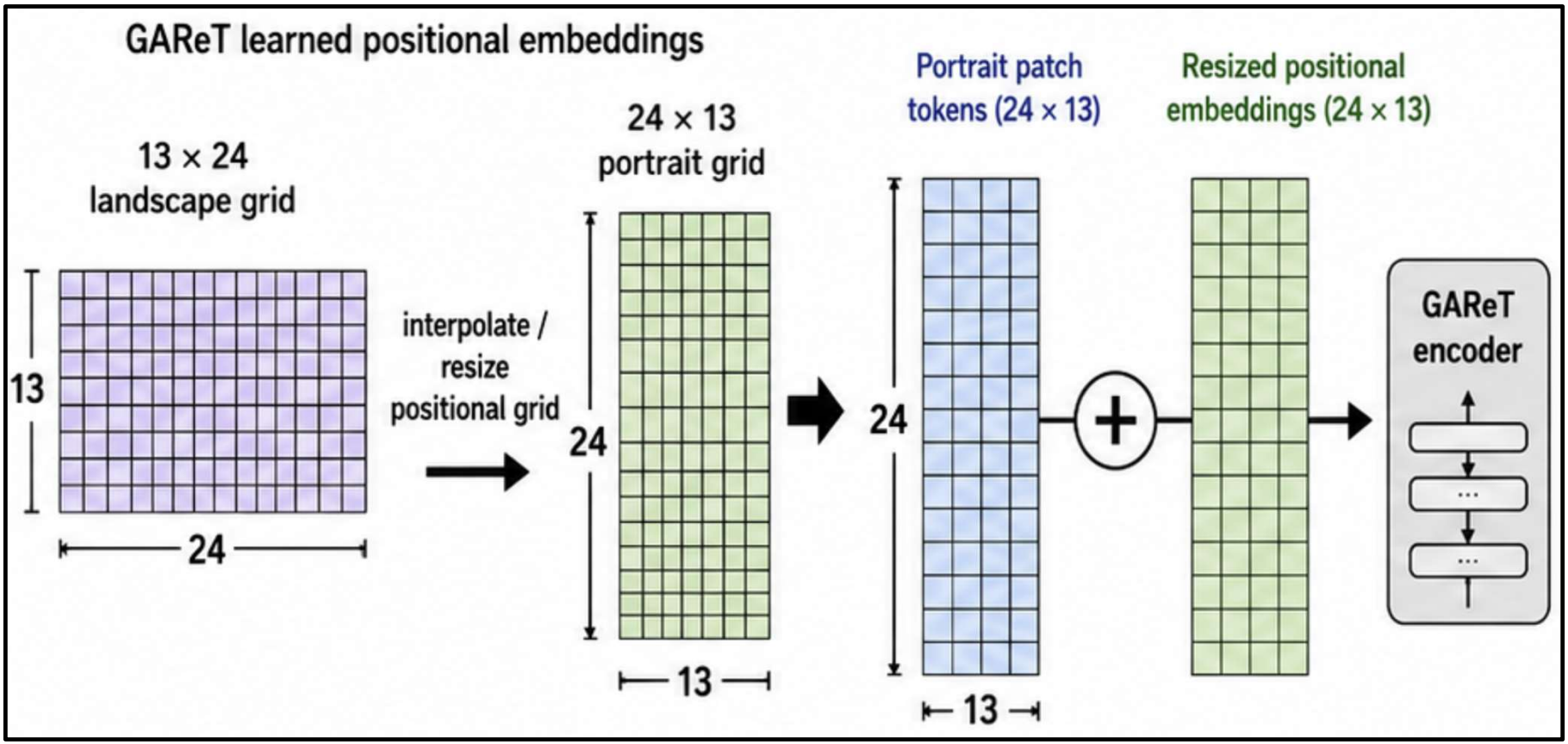



# Grouping sequences into bursts will also help avoid large centroid crops

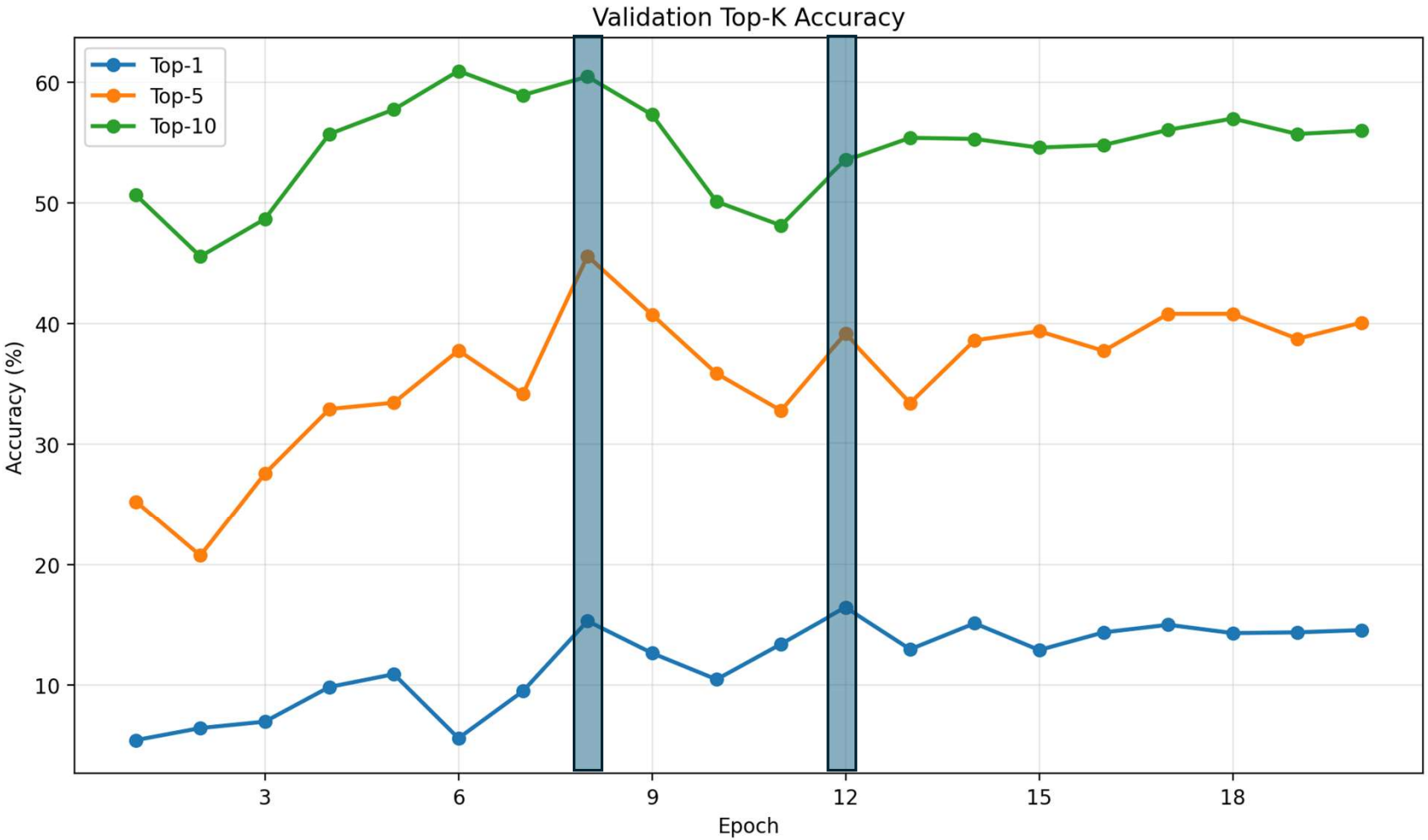


# Before discussing recent fine-tuning results: an update on reformatting query frames



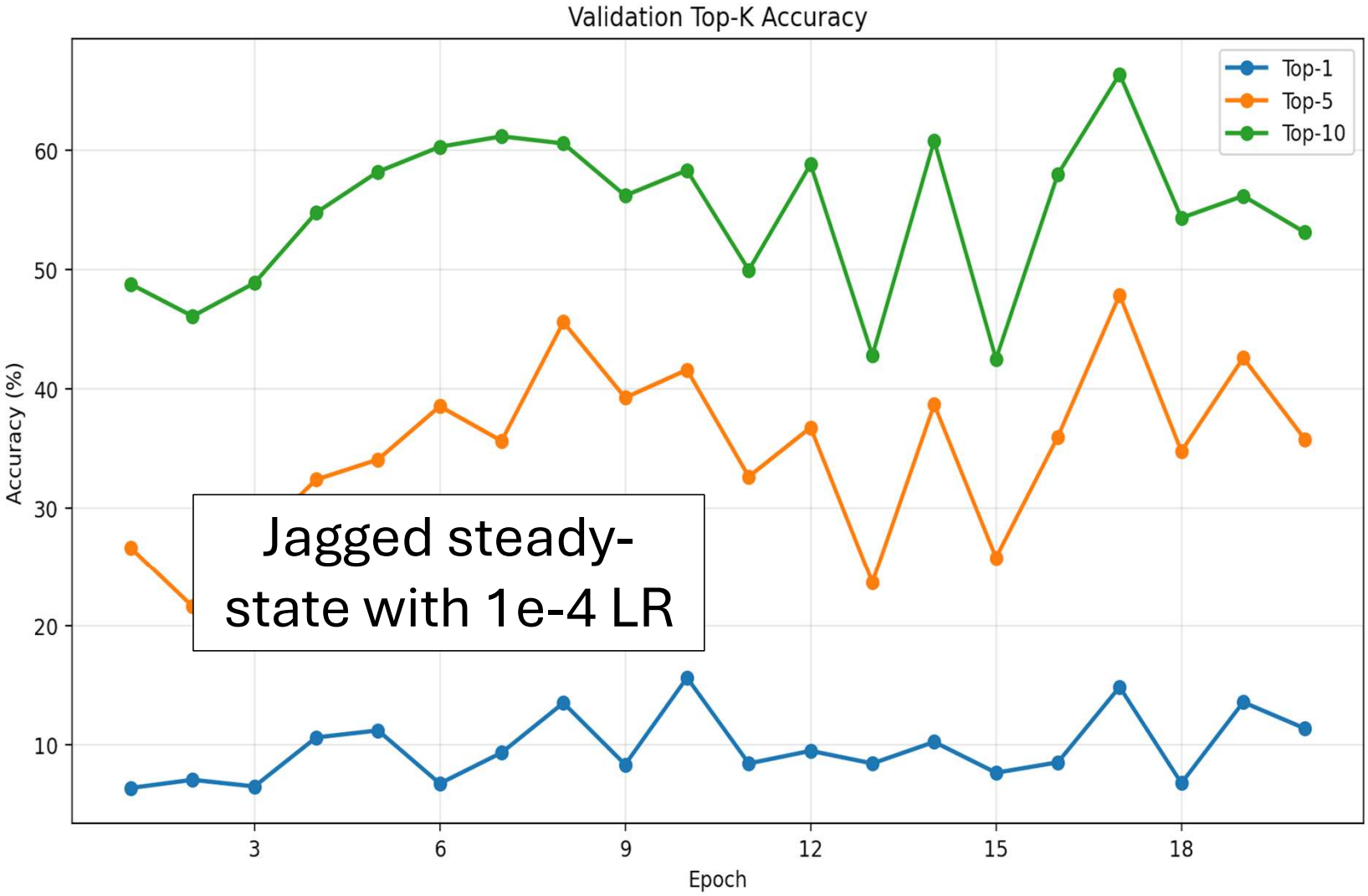
**EN** **1792 x 1792 Center Crop S2I, 256 x 256 (50% Stride) F2F**
**6 Sampled References/Site LR: cos Interpolated P.E.**



**EN**

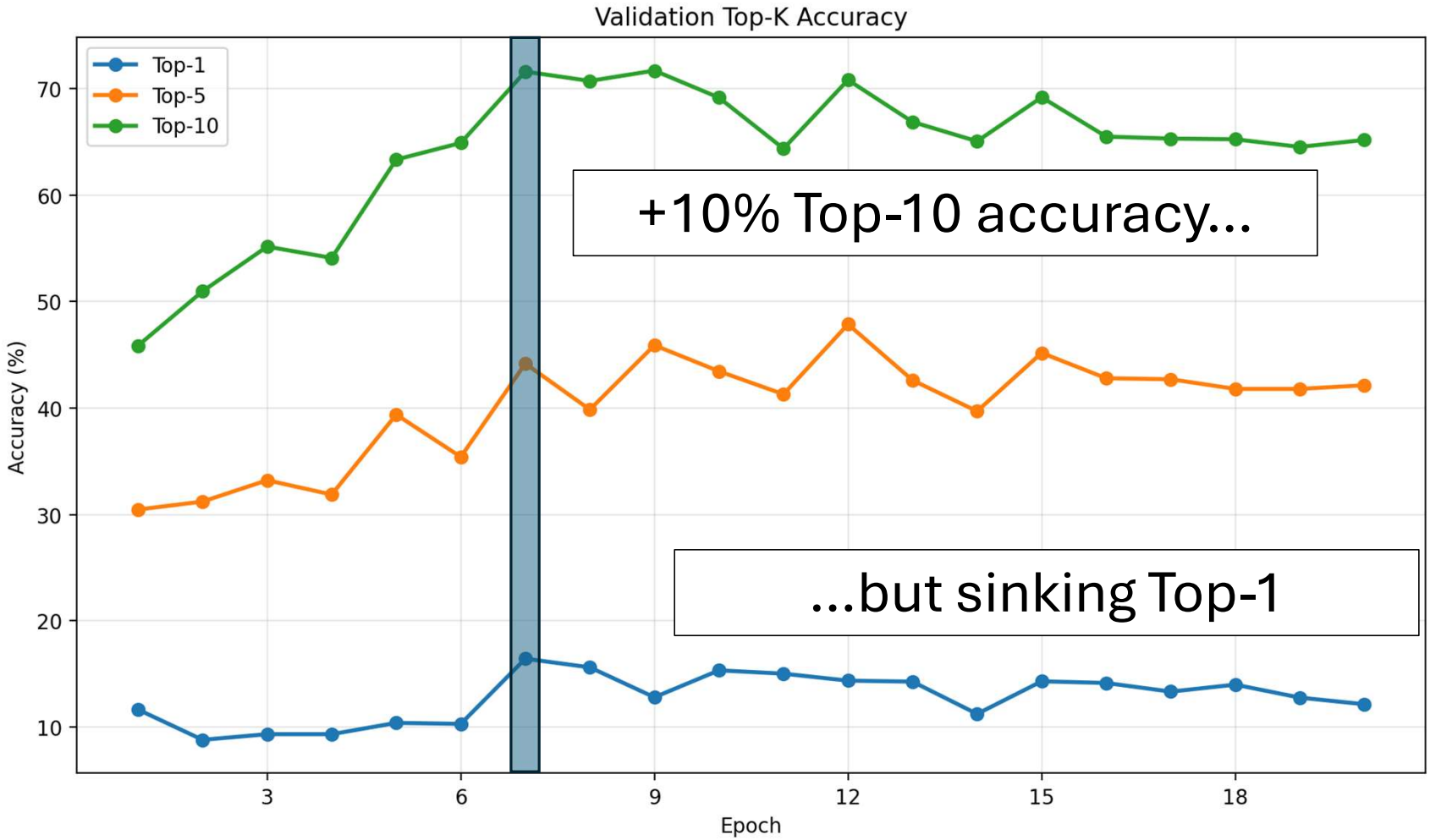
**Positional Embedding Interpolation**

**1024 x 1024-Pixel S2I (50% Stride), 256 x 256-Pixel F2F (50% Stride)** **LR: 1e-4**



# EN

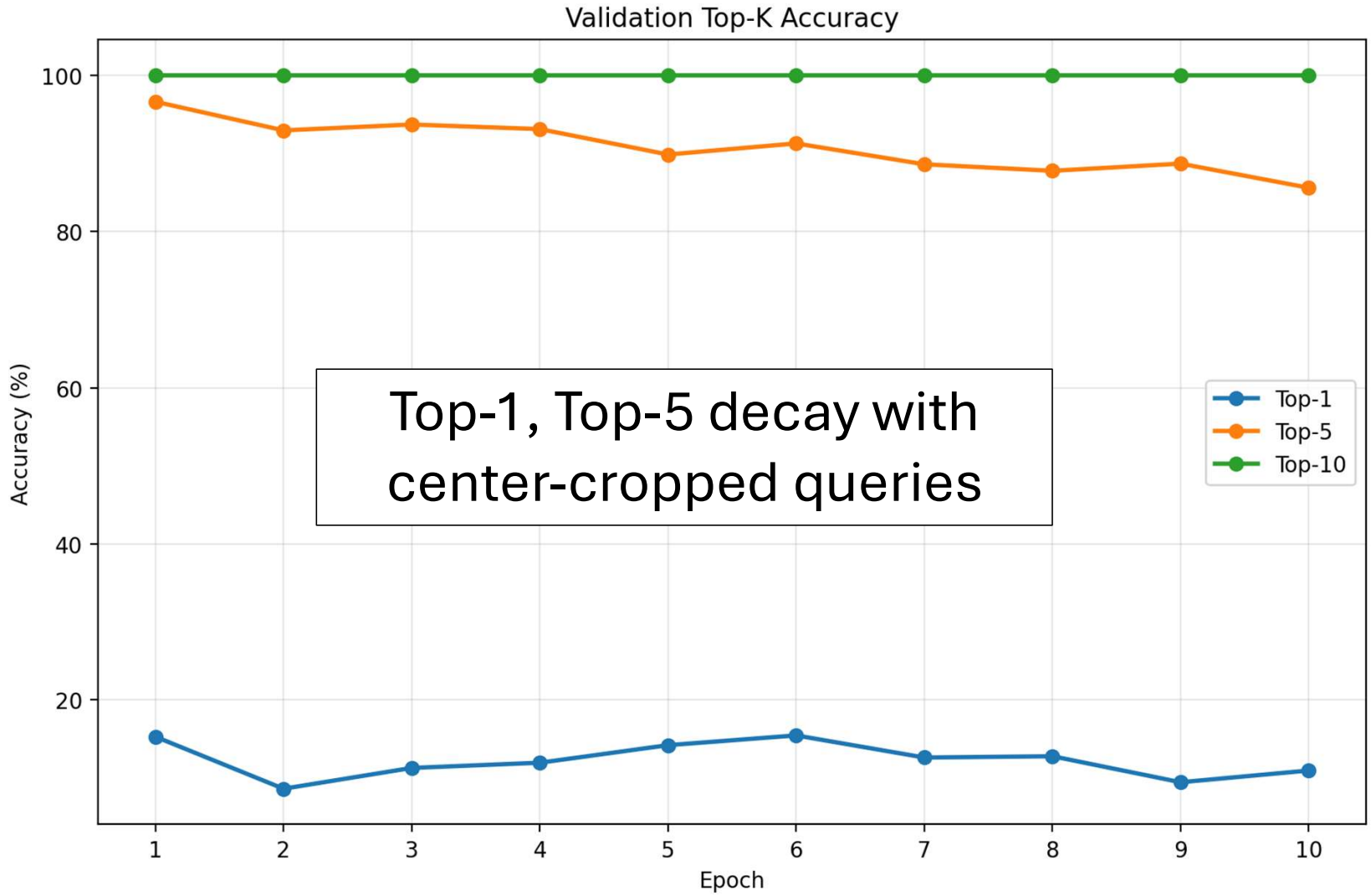
## 1792 x 1792 Center Crop S2I, 256 x 256 (50% Stride) F2F
## 6 Sampled References/Site LR: cos Cropped Queries

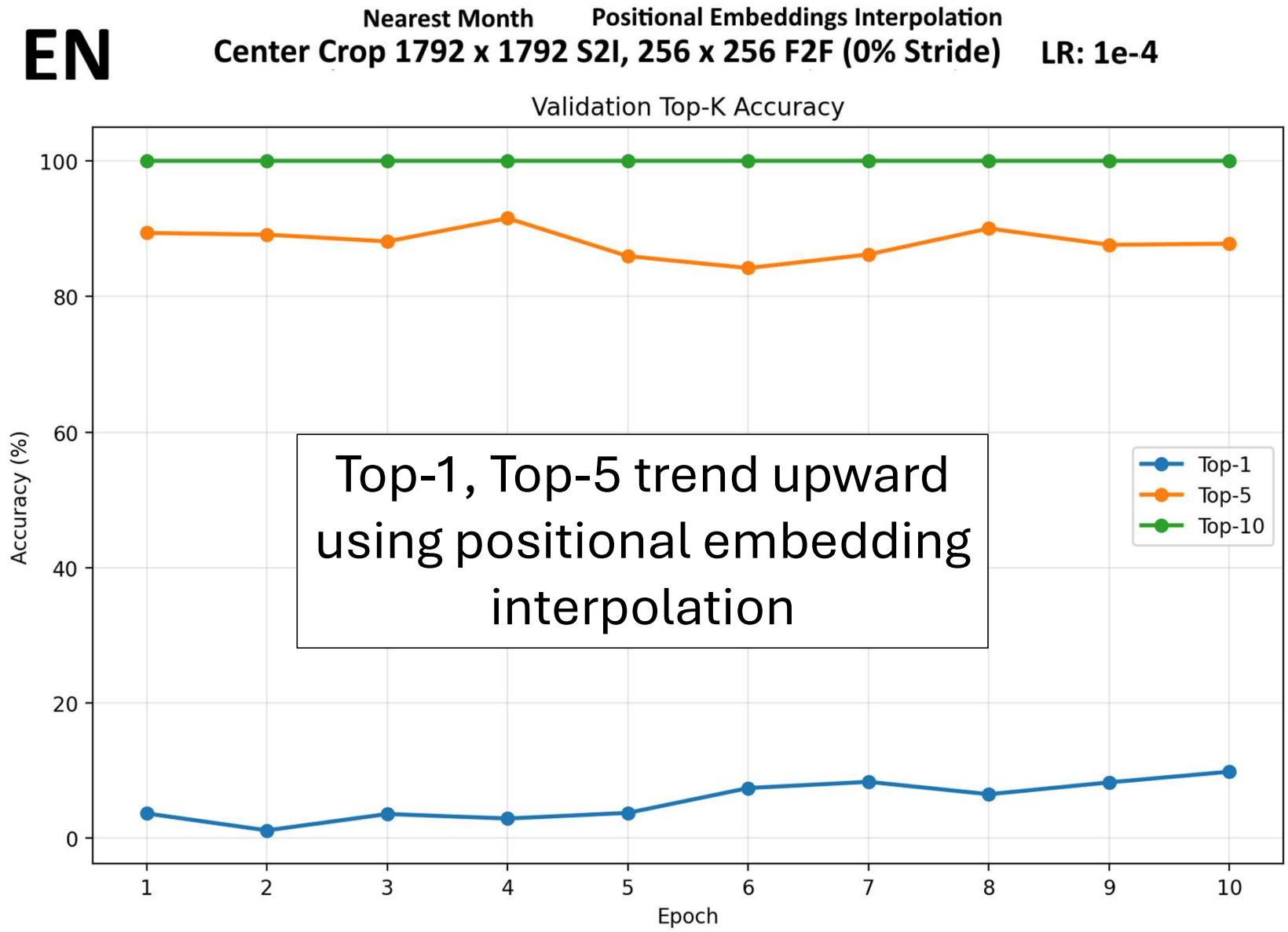


**EN**

**Nearest Month** **Center-Cropped Queries**

**Center Crop 1792 x 1792 S2I, 256 x 256 F2F (0% Stride)** **LR: 1e-4**

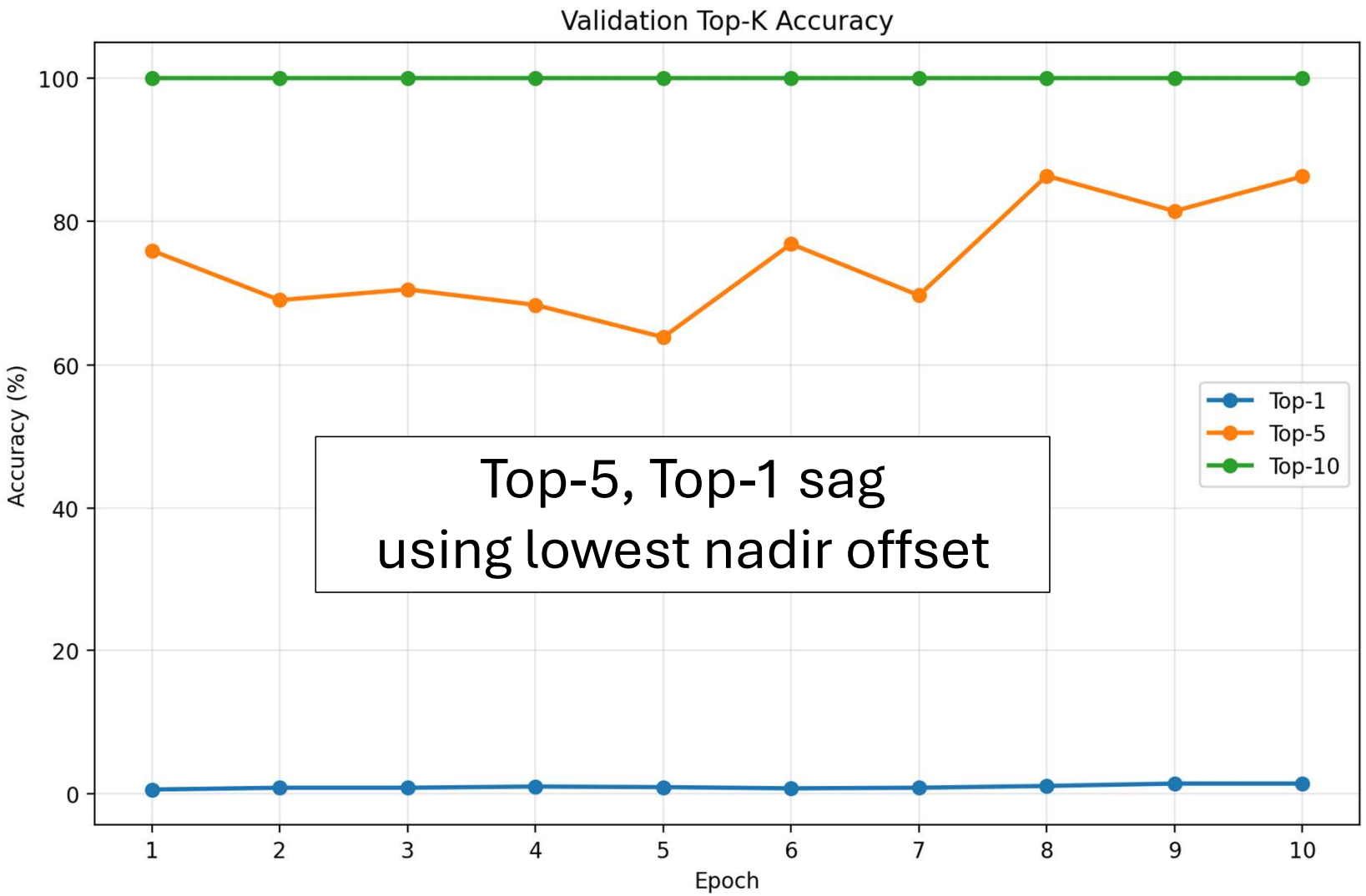



EN
Nearest Month
Positional Embeddings Interpolation
Center Crop 1792 x 1792 S2I, 256 x 256 F2F (0% Stride)
LR: 1e-4
Validation Top-K Accuracy
Accuracy (%)
Epoch
Top-1
Top-5
Top-10
Top-1, Top-5 trend upward using positional embedding interpolation

**EN**

**Lowest Nadir Offset** **Positional Embedding Interpolation**

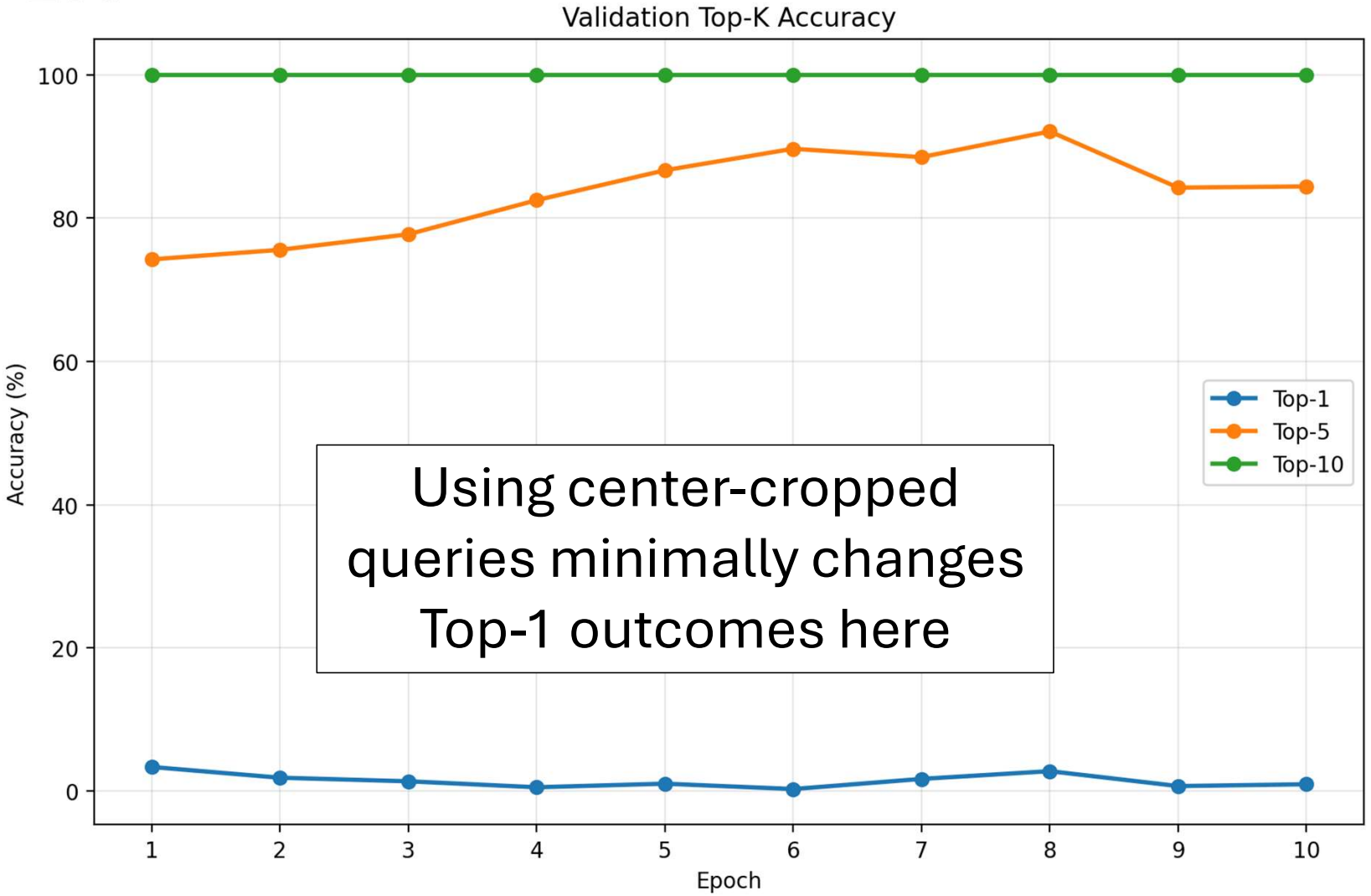
**Center Crop 1792 x 1792 S2I, 256 x 256 F2F (0% Stride)** **LR: 1e-4**



**EN**

**Lowest Nadir Offset** **Center-Cropped Queries**

**Center Crop 1792 x 1792 S2I, 256 x 256 F2F (0% Stride)** **LR: 1e-4**



**Final Week Goal**:

- Improve Soumik and Steven's leaderboard score
    - Obtain GAReT-only challenge scores

***768-256 approach on nearest-month crops***