

Cross-View Yaw Estimation in Location Uncertainty with Line-Aligning Yaw Scoring

Taeho Kang · Nairan Zhang · Yelin Kim · Yujiao Shi · Youngki Lee · **ECCV 2026 Oral Presentation**

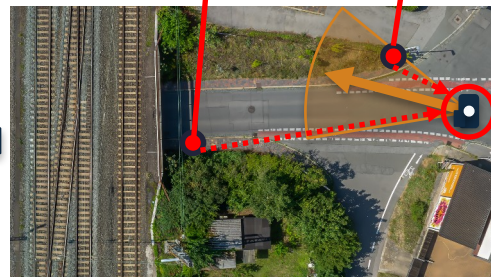
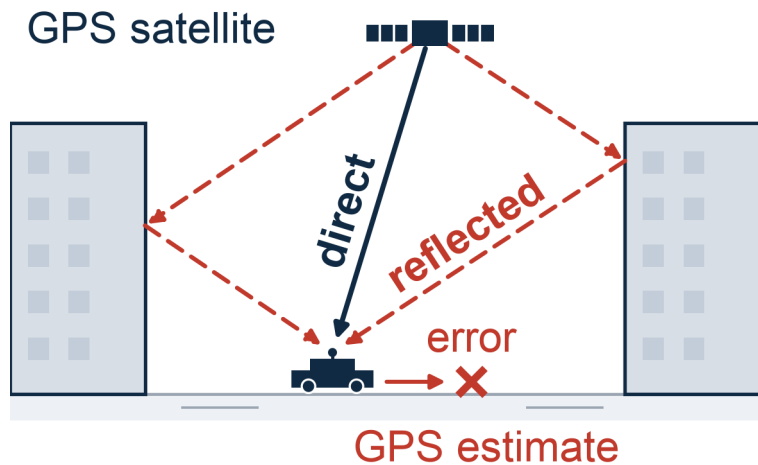


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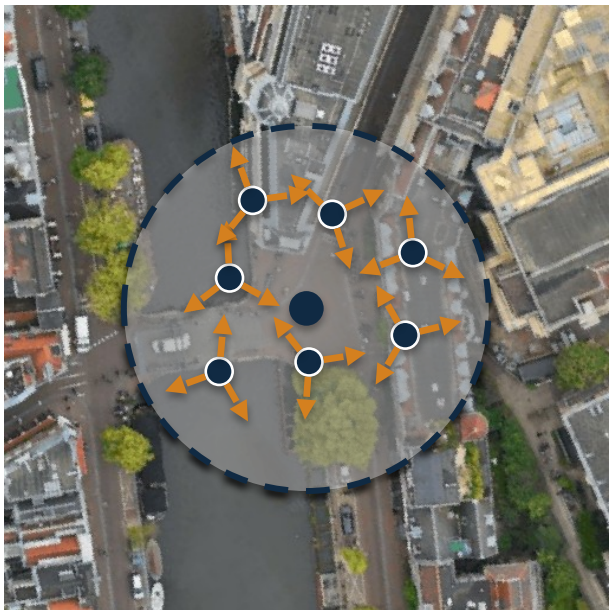


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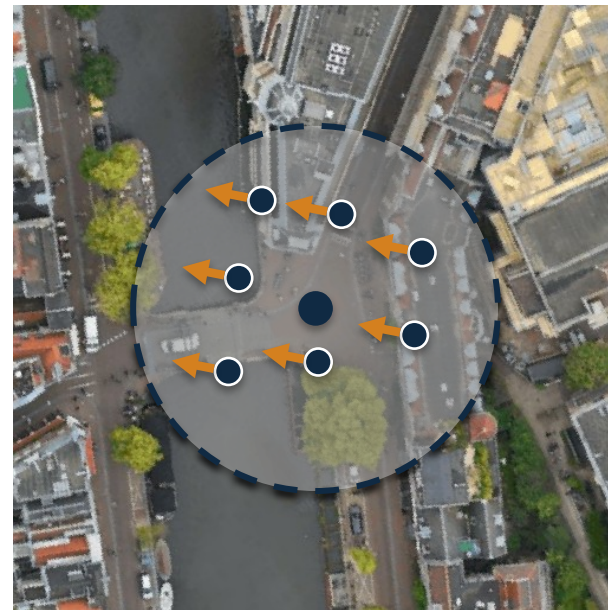
Background: Cross View Localization



Key Idea: Estimate Yaw First

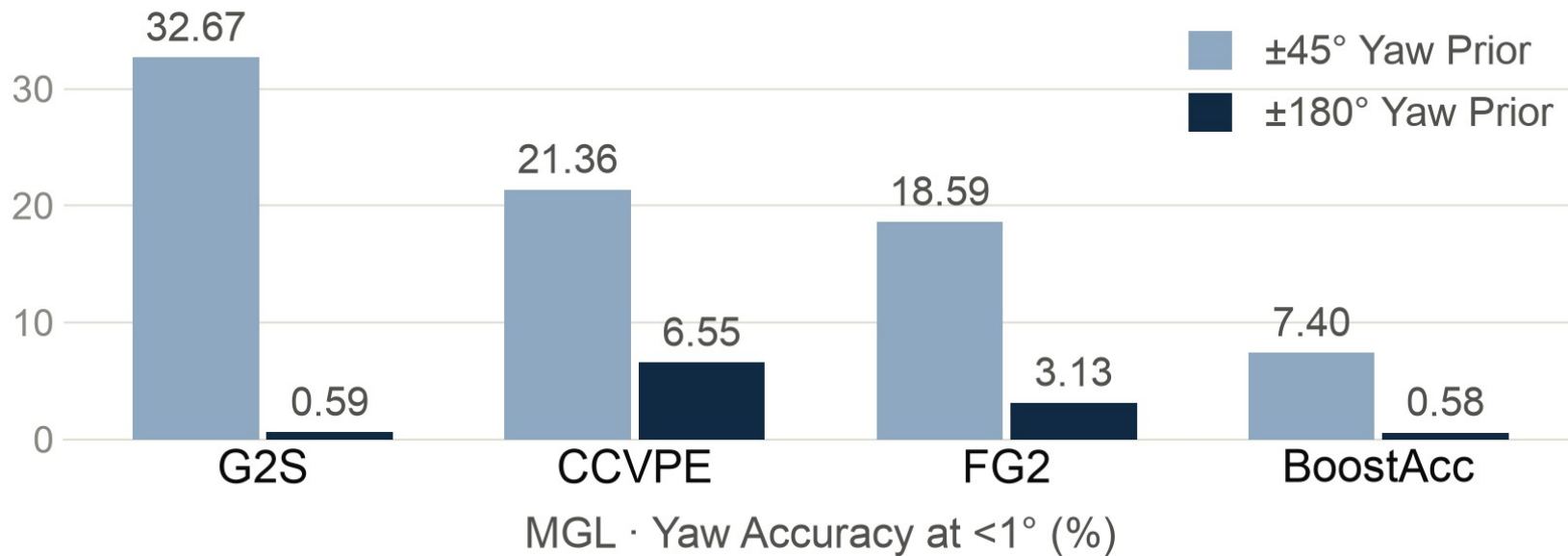


3-DoF

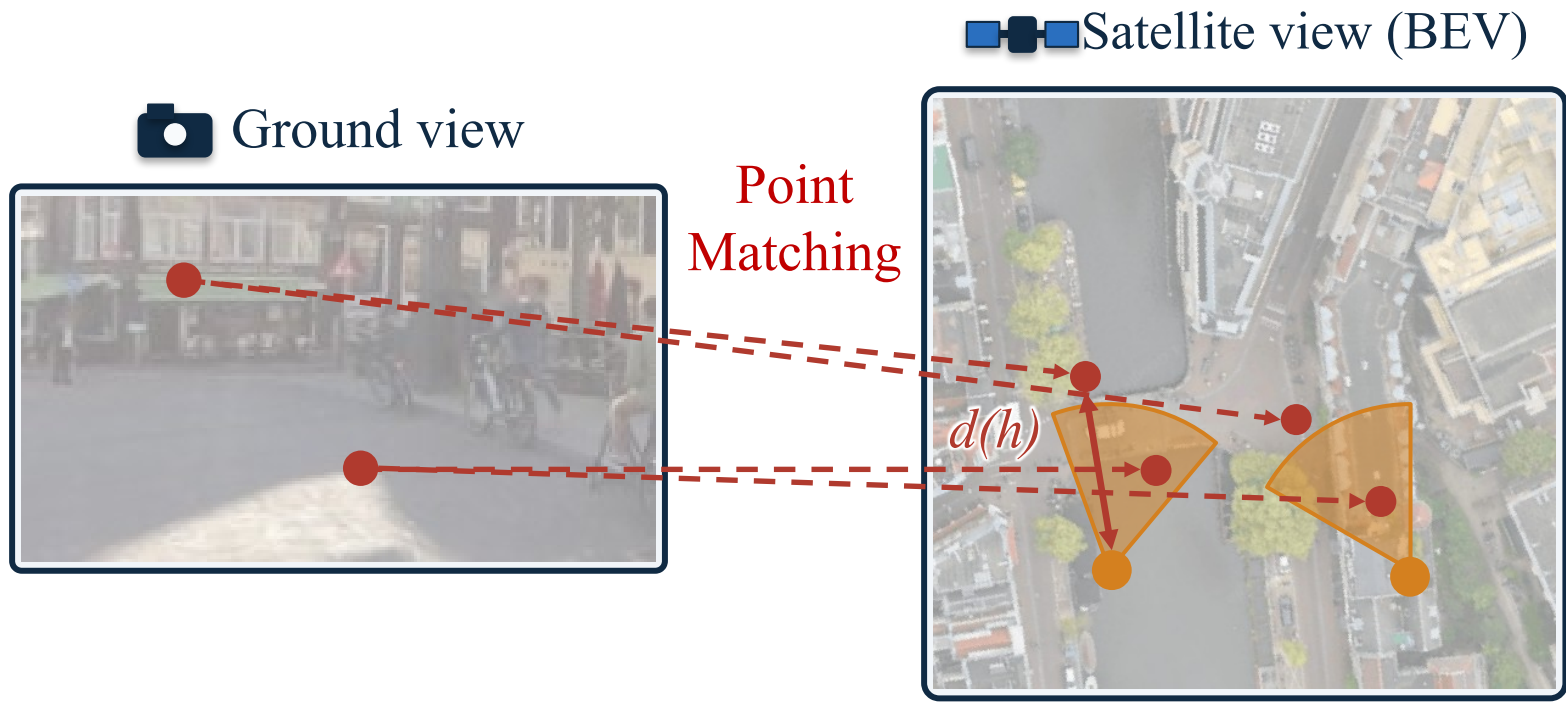


2-DoF

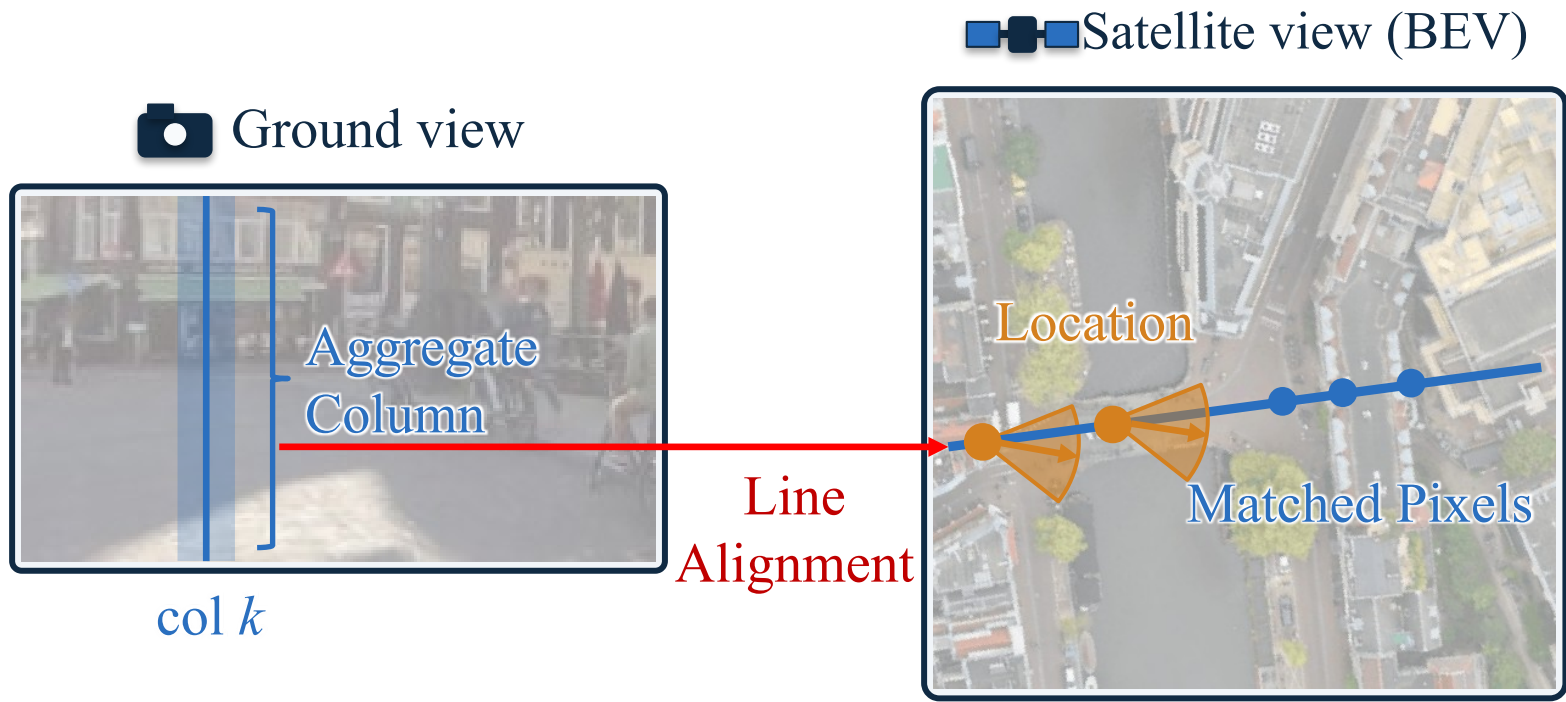
Problem: Baselines Need a Yaw Prior



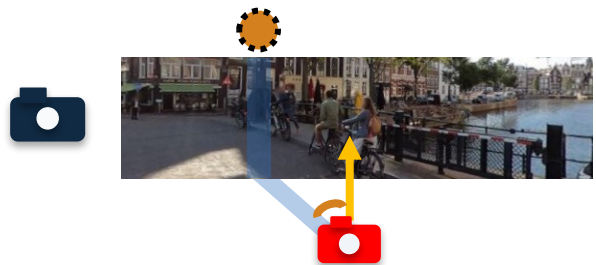
Prior approach: Point matching



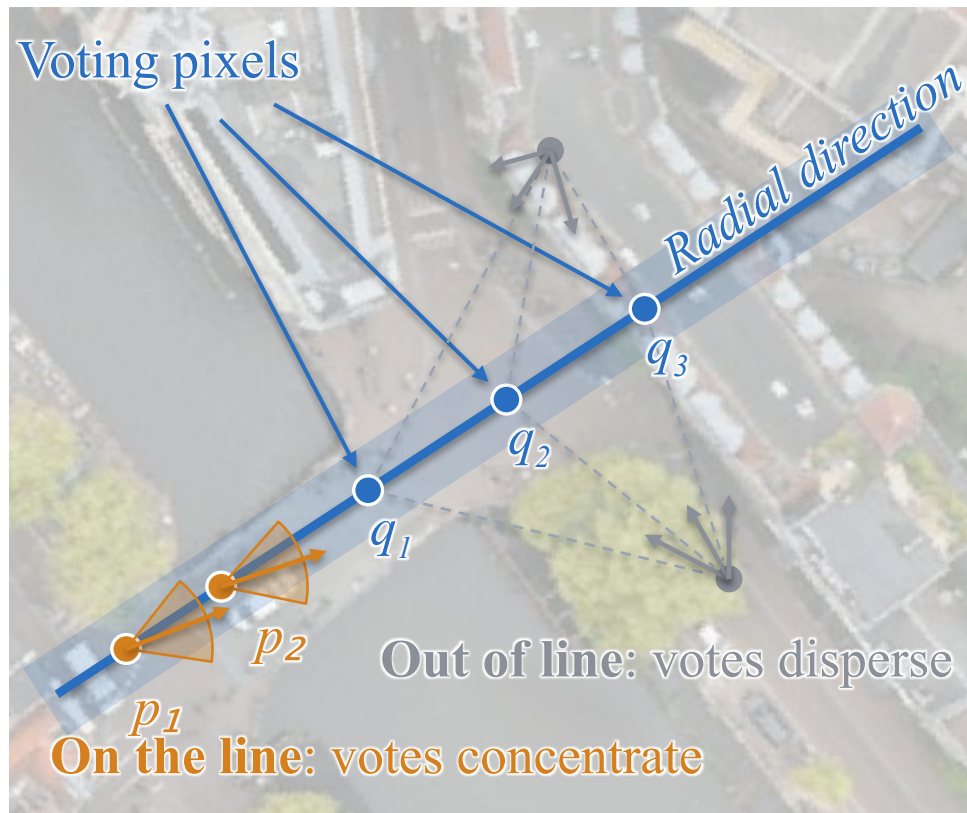
Key Idea: Line Alignment



Key Advantage: Position-Invariant Yaw



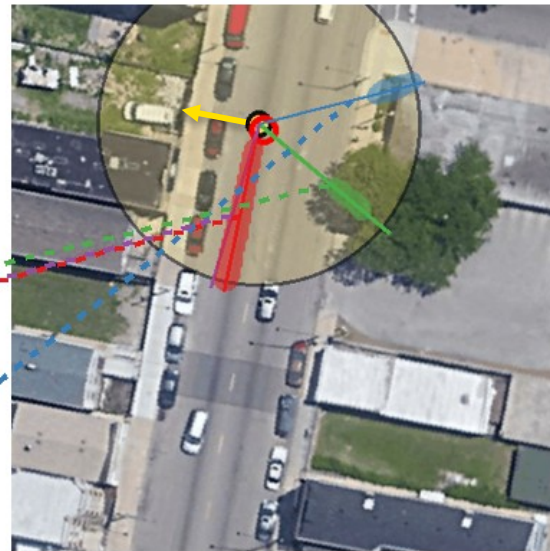
$$\theta_{\text{est}}(\mathbf{p}_1, \mathbf{q}_i) = \theta_{\text{est}}(\mathbf{p}_2, \mathbf{q}_i)$$



Line Alignment in a Real Scene



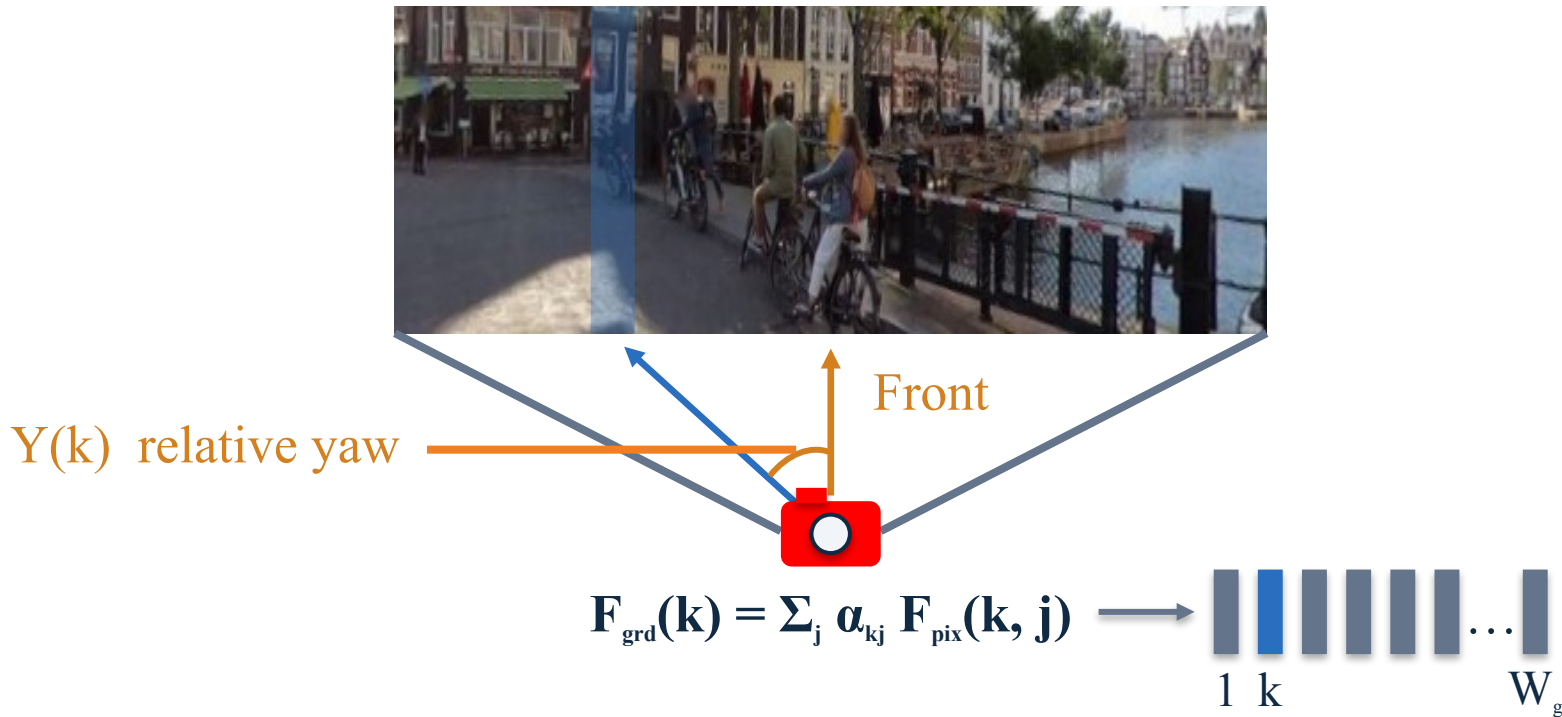
Pixels' Contribution to the Estimation



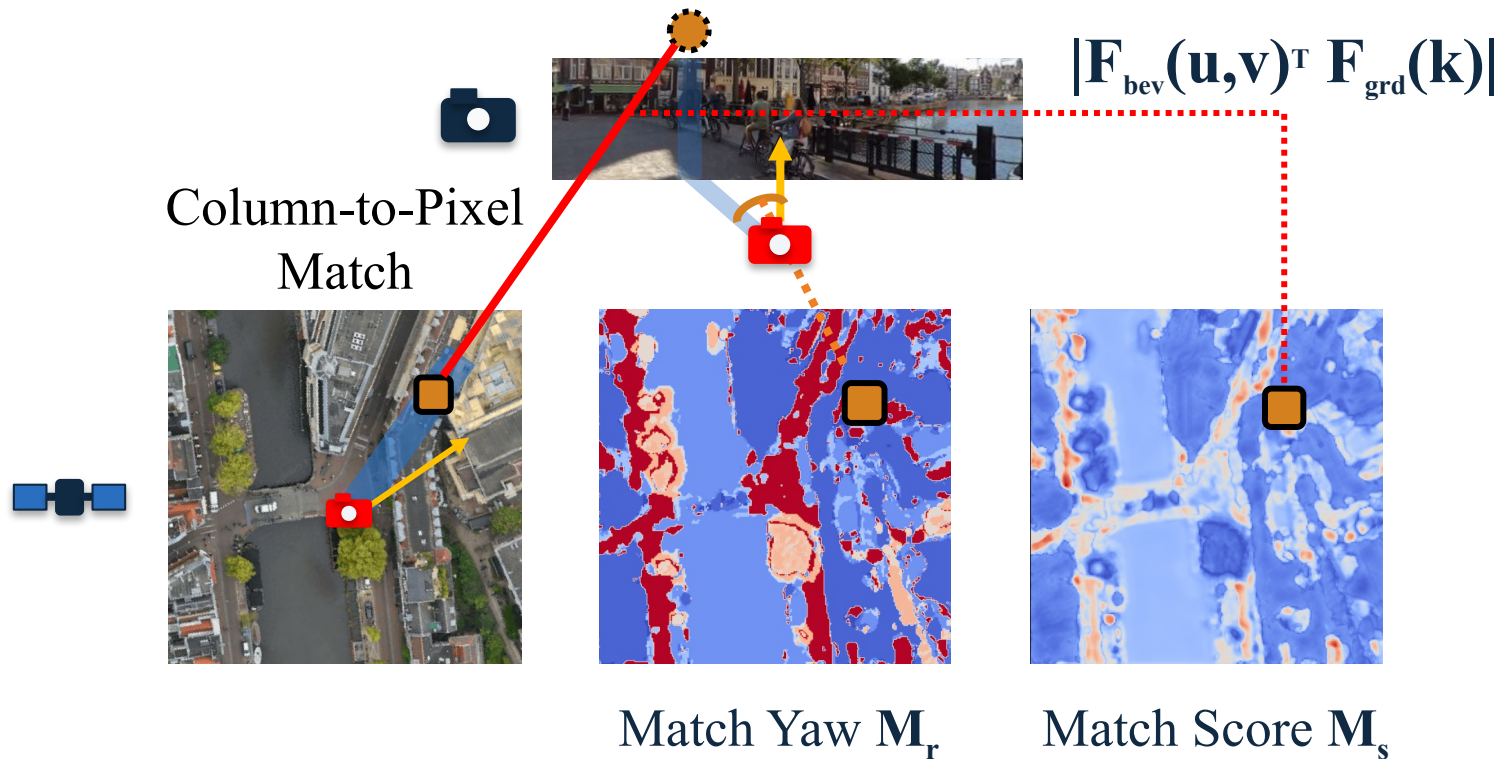
 Ground truth  Estimate

Method: Column aggregation

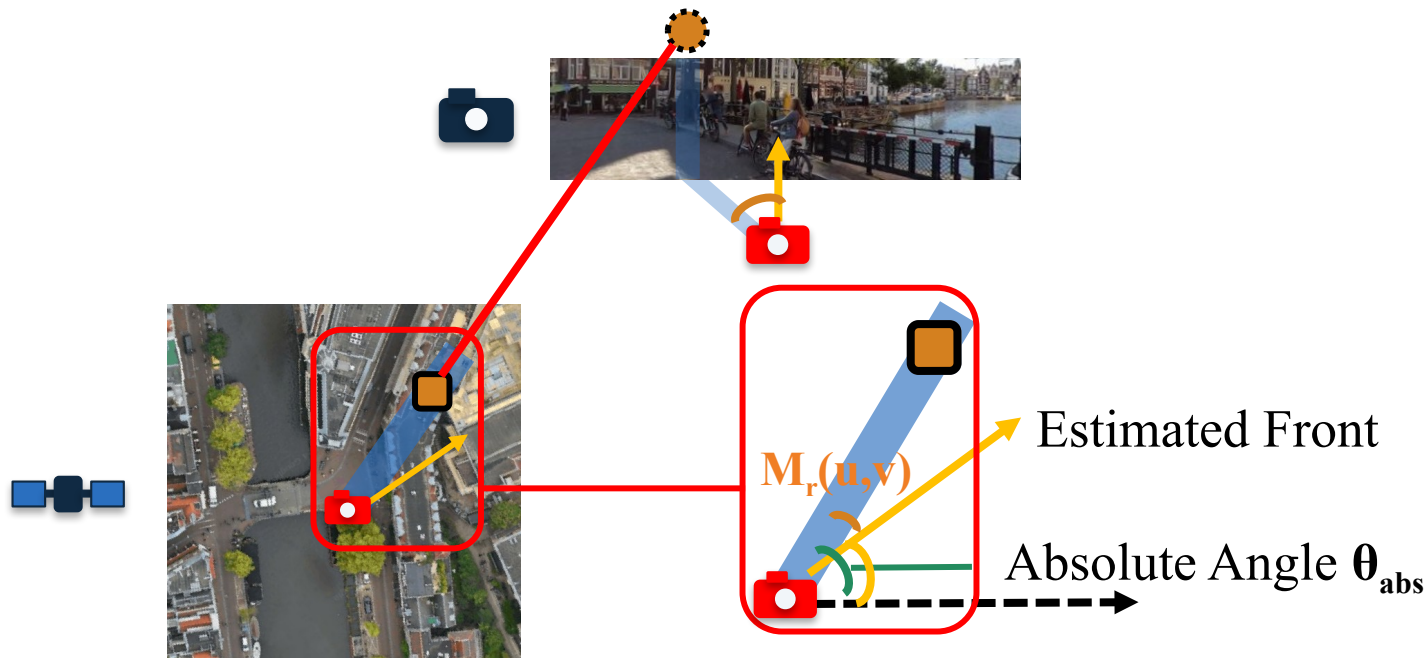
Column k



Method: Ground-Satellite Matching

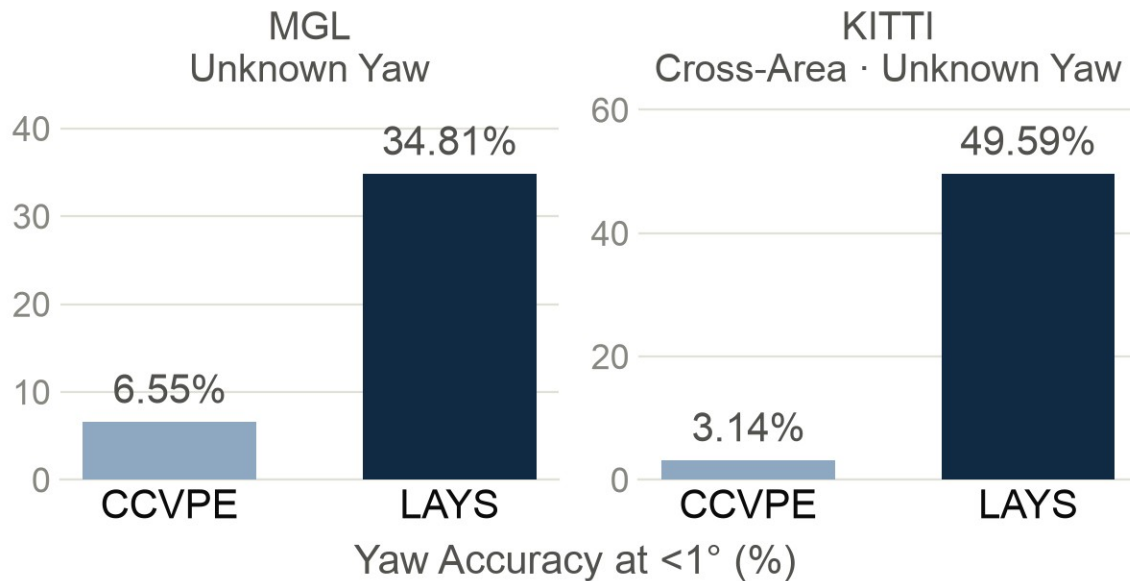


Yaw Votes

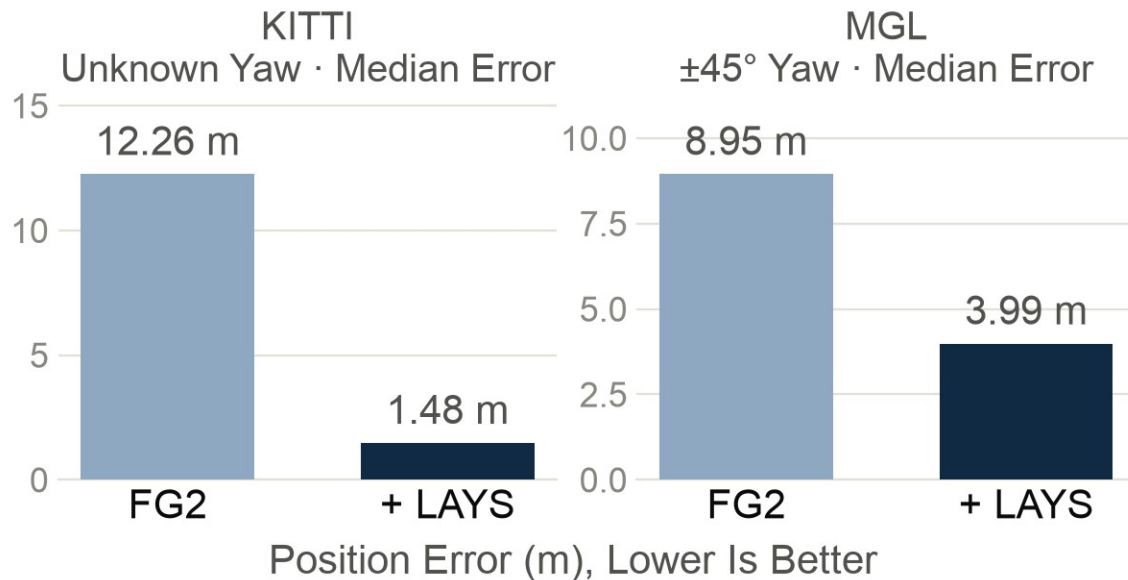


Vote goal: $S(\theta_{est}, x, y) += M_s(u, v)$ $\theta_{est} = \theta_{abs} - M_r(u, v)$

Results: Yaw accuracy



Result: Enabling Localization under Unknown Yaw



Summary

- Decouple yaw from position and estimate heading first.
- Position-invariant yaw through column-to-radial-line alignment.
- Enables localization under unknown yaw: 12.26 m to 1.48 m.



Project page

tho-kn.github.io/projects/LAYS

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