

Robomaster – Awards and Demos

National Champion (2024, 2025) | Real-World Deployment | Adversarial & Real-Time Setting

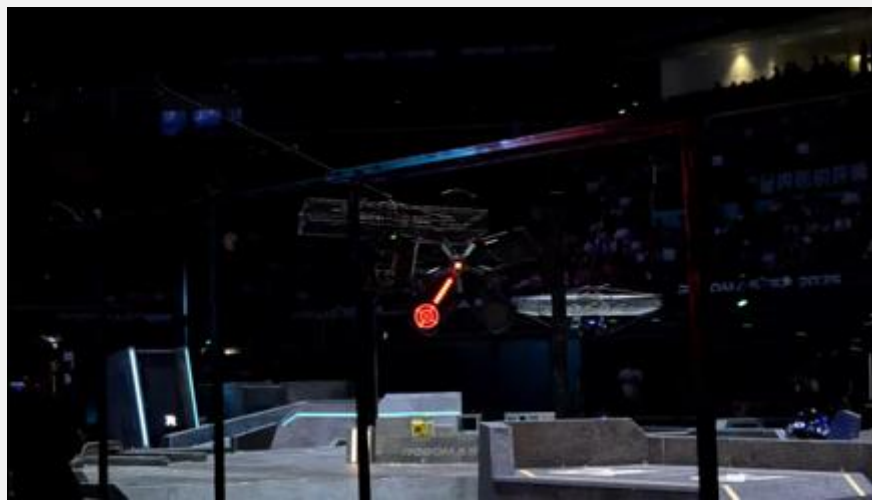


上海交通大学

SHANGHAI JIAO TONG UNIVERSITY



National Champion - 2024



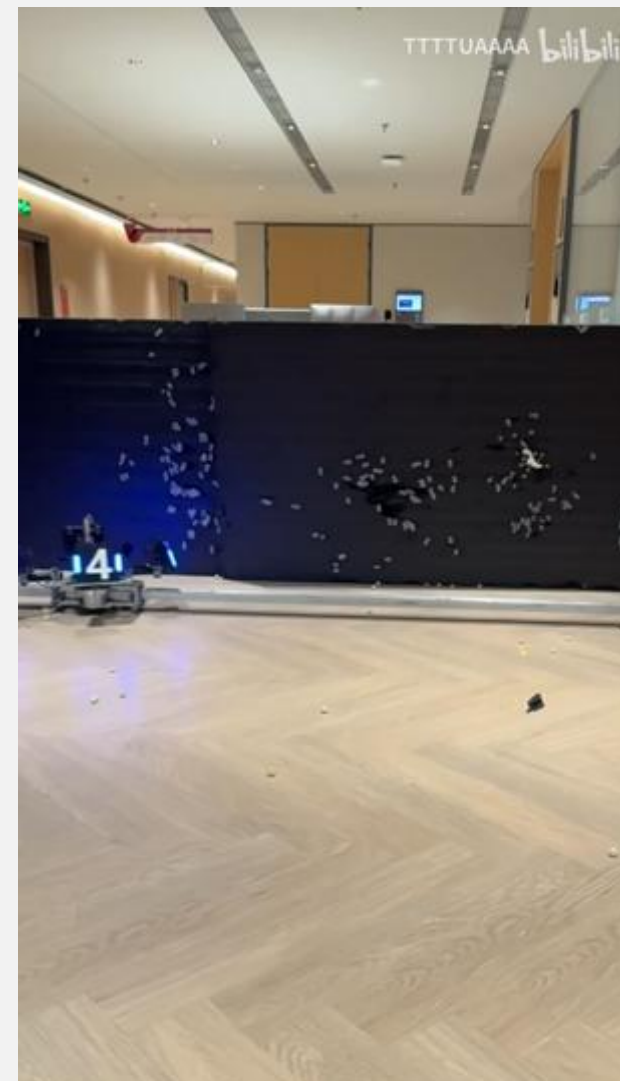
Activate Energy Module with Drone [\[demo\]](#)



National Champion - 2025



Autonomous Navigation (SLAM + MPC) [\[demo\]](#)

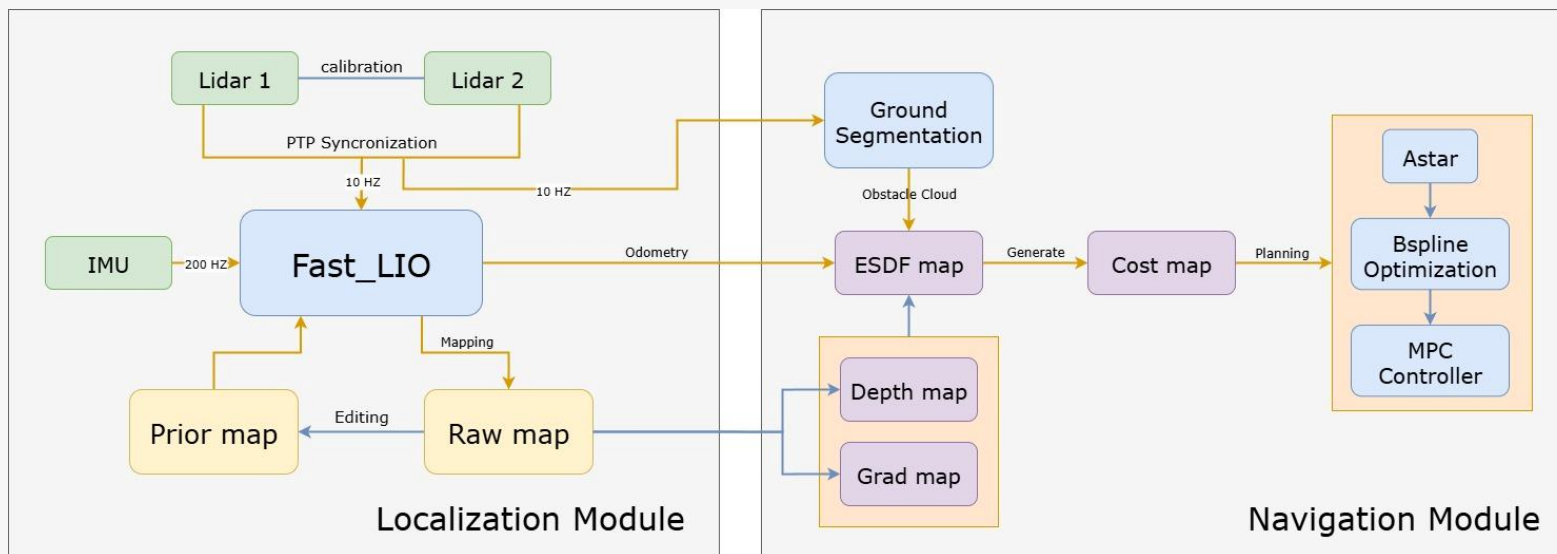


Real-Time Auto-Aiming [\[demo\]](#)

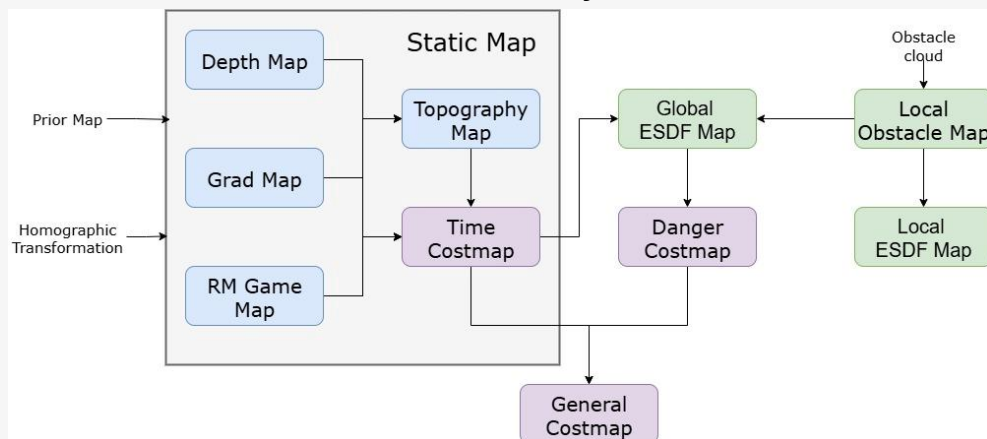
All RoboMaster demo videos: [link](#)

RM Award - SLAM and Navigation System

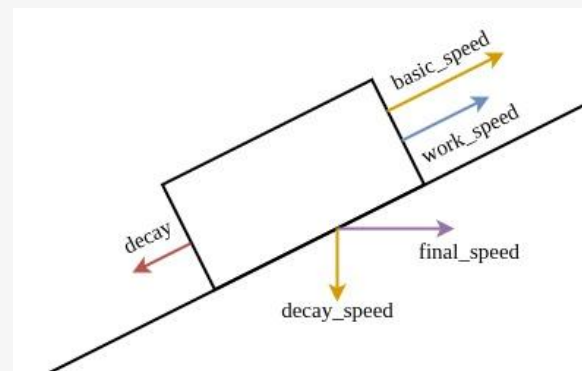
Factorized Maps and Structured Costs for Real-Time Navigation



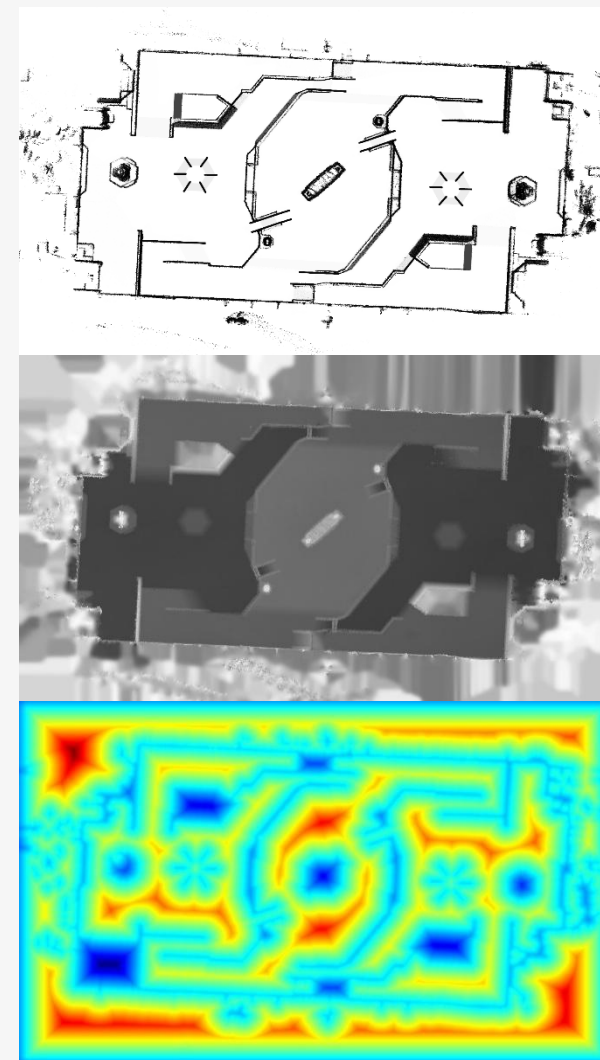
System Framework



Map Module Framework



Slope Cost Design



Grad, Depth and ESDF map

Representation Matters for Visuomotor Alignment

Manuscript in preparation. Targeting RSS 2026.



Problem: Spurious correlations in action attention

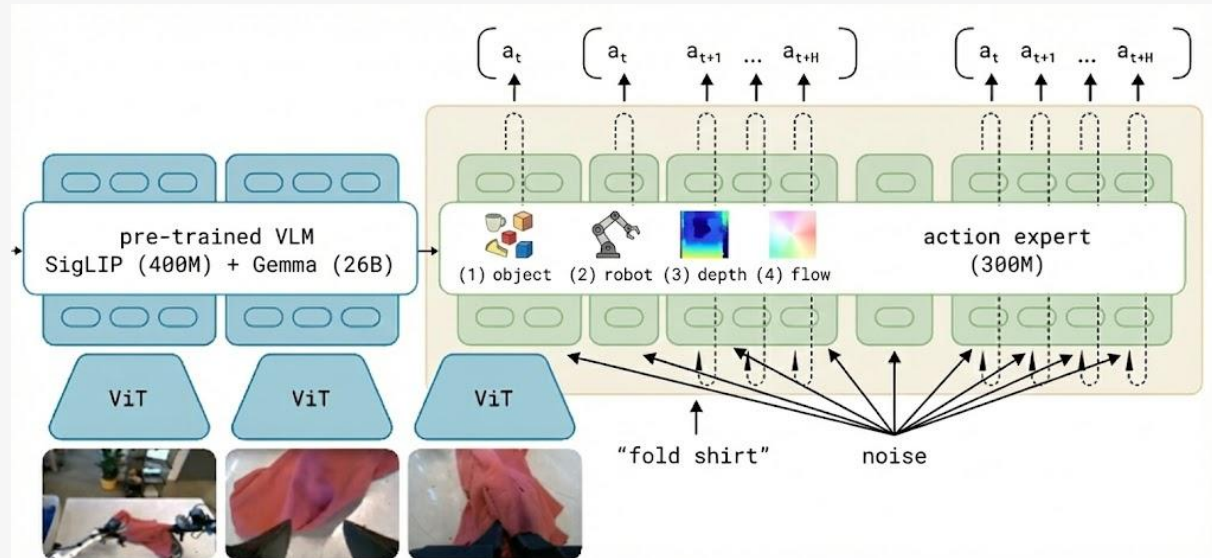


Action tokens attend to task-irrelevant regions

Contributions:

- Propose a factor-decoupled attention design where different attention heads specialize in distinct perceptual factors
- Enable end-to-end joint optimization of heterogeneous attention heads within a unified policy
- Validate the effectiveness of factor decoupling across multiple robotic manipulation benchmarks (LIBERO/RoboTwin)

Our Method: Factor-**Decoupled** Representation Learning



Explicitly separate object, robot, depth, and flow representations

Preliminary Results:

Qualitative analysis on LIBERO; Task performance evaluated on RoboTwin 2.0



π_0 -attn (heatmap)

π_0 -depth (depth pred)

Model	Bottle Adjust	Hammer Block	Bin Dump	Card Relocation
π_0	71%	75%	61%	69%
π_0 -attn	99%	81%	90%	81%

Task-Level Performance on RoboTwin 2.0

Supplymentary videos: [link](#)