



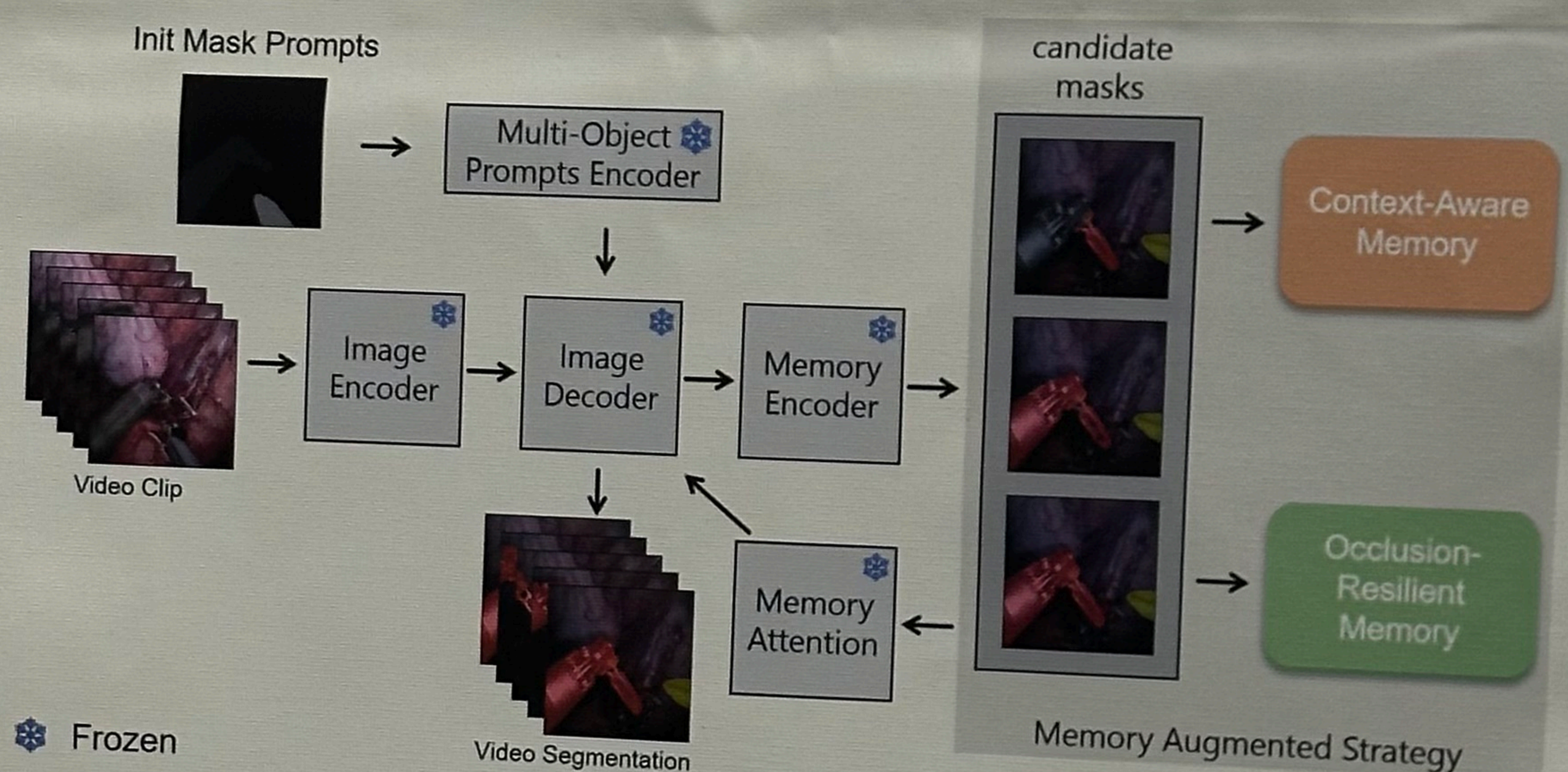
Object Displacement

Object Occlusion

- Tracking errors occur when objects temporarily disappear and reappear or when multiple objects overlap.
- SAM2 processes frames sequentially, leading to accumulated instability.

Method

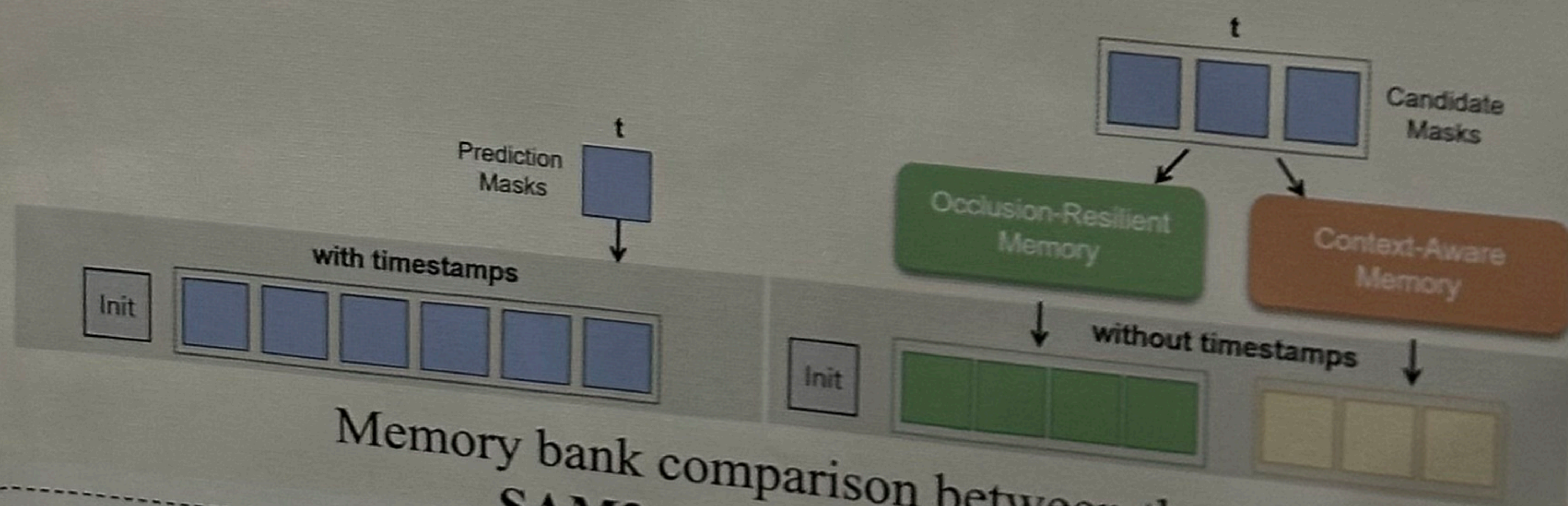
➤ Overview of MA-SAM2



MA-SAM2 is a **training-free, one-prompt** extension of SAM2 for surgical instrument tracking, reducing jitters and ambiguities to enhance efficiency in surgical videos.

➤ Memory Augmented Strategy

A dynamic memory bank with **Context-Aware Memory** and **Occlusion-Resilient Memory**, enabling long-term modelling and robust tracking under occlusion.



References

- [1] Yang, Jinyu, et al. "Track anything: Segment anything meets videos. arXiv 2023." arXiv preprint arXiv:2304.08482.
- [2] Zhang, R., et al. "Personalize segment anything model with one shot. arXiv 2023." arXiv preprint arXiv:2304.08482.
- [3] Liu, Haofeng, et al. "Surgical sam 2: Real-time segment anything in surgical video by efficient frame pruning. arXiv 2023." arXiv preprint arXiv:2304.08482.
- [4] Ravi, Nikhila, et al. "Sam 2: Segment anything in images and videos." arXiv preprint arXiv:2408.00714 (2024).