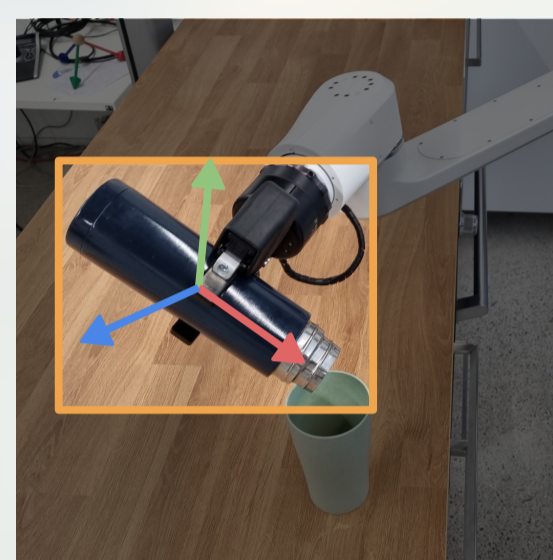


Motivation



Reliable 3D object perception is a cornerstone of modern robotics and augmented reality. While current systems can recognize and locate objects they were specifically trained on, the real world is full of unseen objects with no available 3D CAD models.

How can we perceive objects we've never seen before using only a few unposed images?

Training



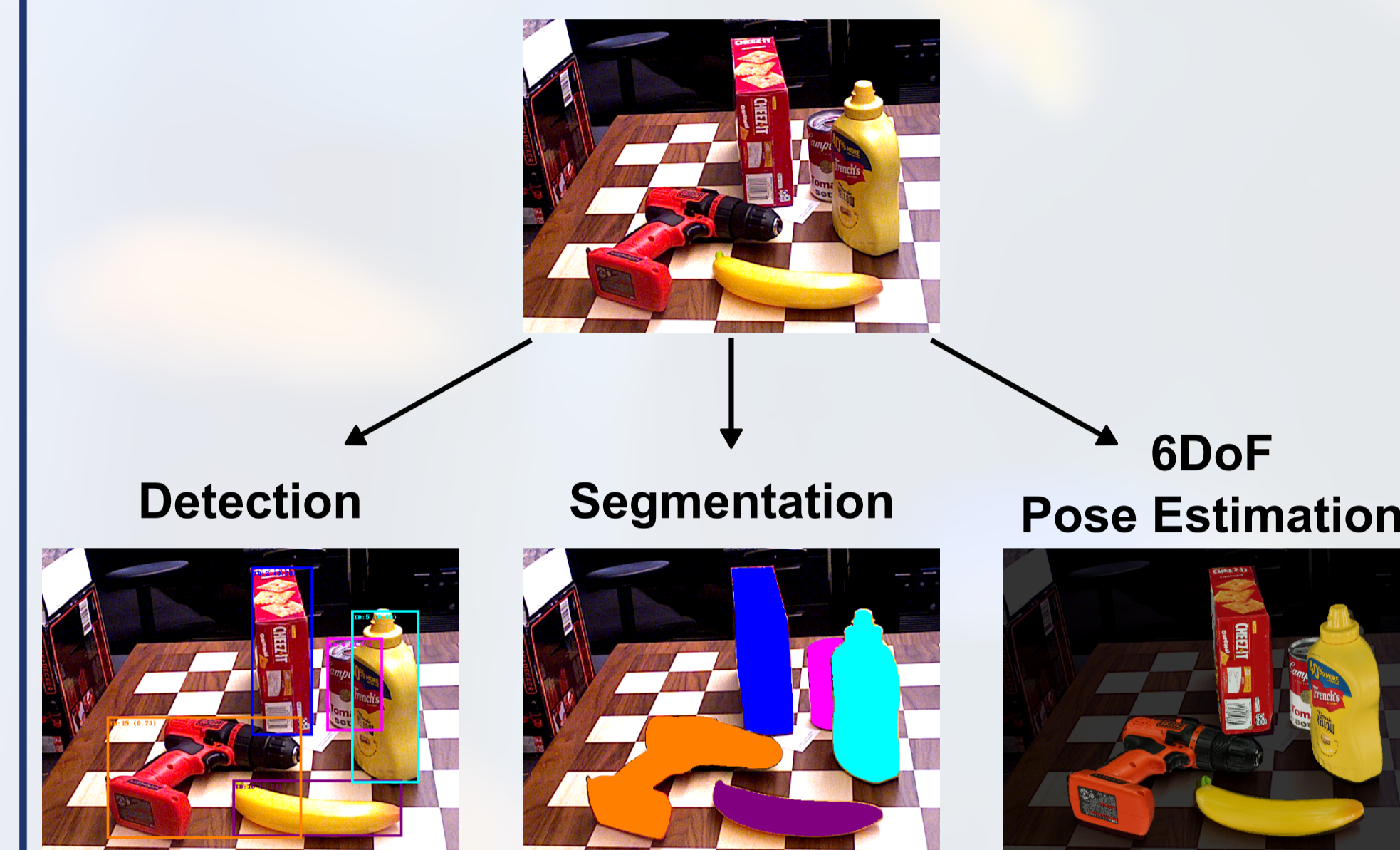
Dataset:

- More than 10.000 objects
- 64 views per object
- 3 different scenarios
- > **2 million** templates

Training:

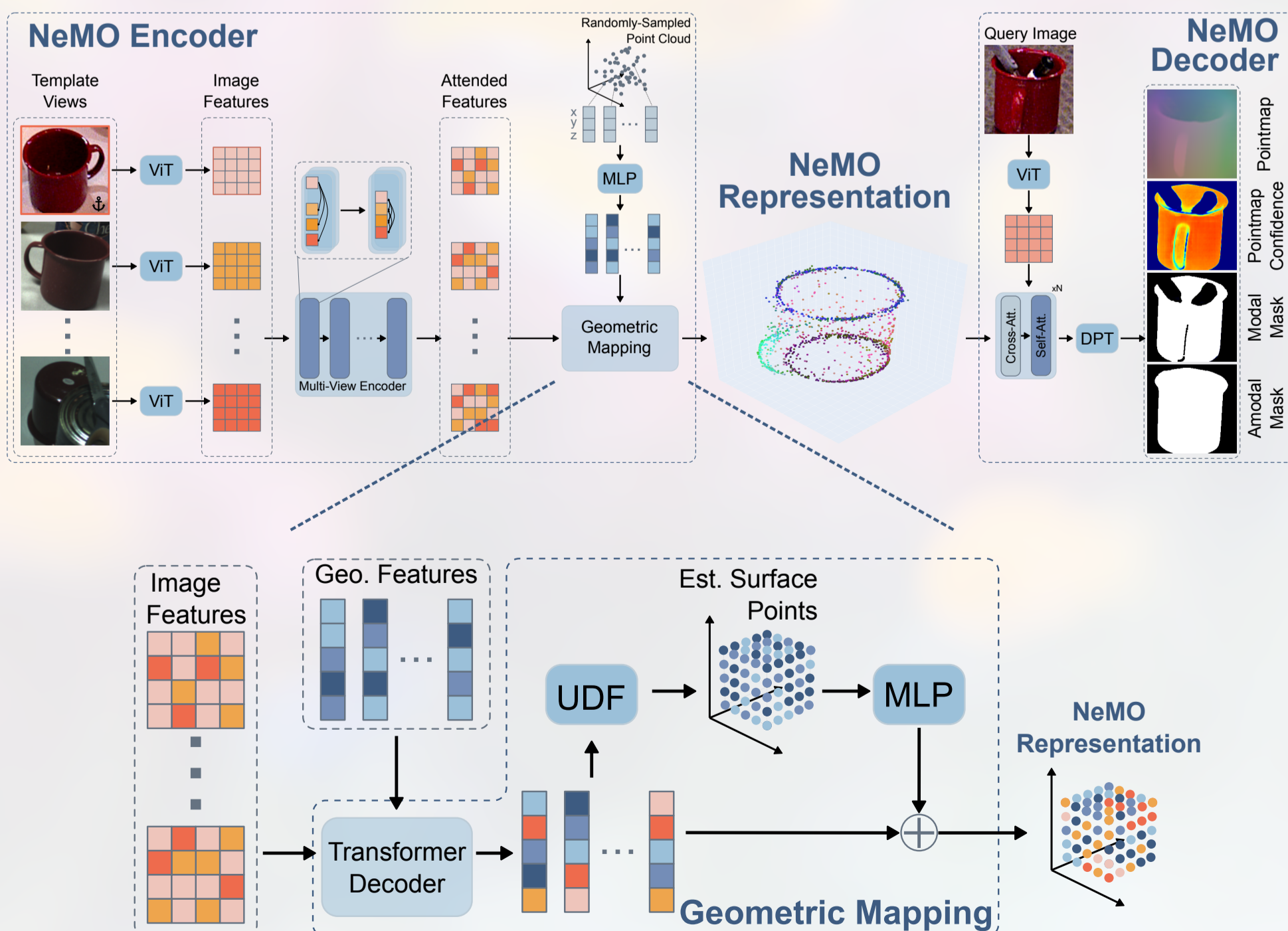
- 10 days on 16 A100 GPUs

Downstream Tasks



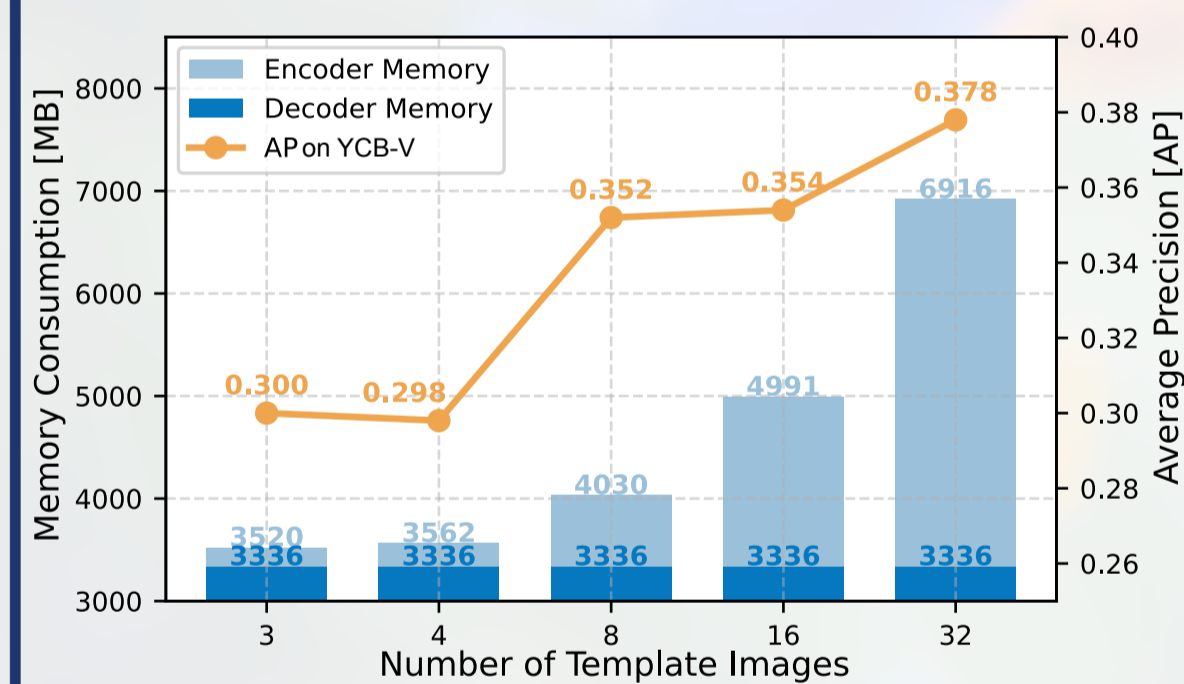
Method

We introduce **NeMO (Neural Memory Object)**, a novel, geometry-aware representation that enables Model-Free 6D Pose Estimation, Detection and Segmentation on objects unseen during training using only a handful of unposed RGB images.



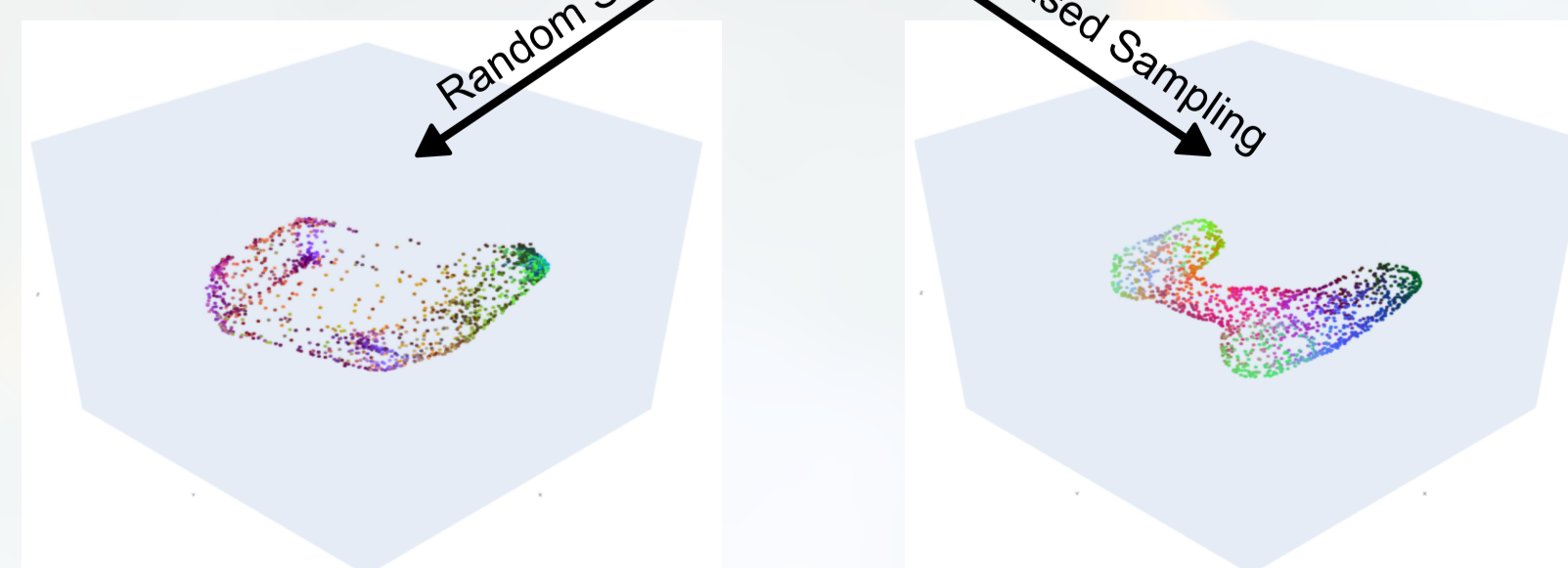
NeMO Properties

Memory Consumption



- Constant...
...inference time
...inference memory
- Continuous object learning

Incorporating Geometric Priors



Object Surface Reconstruction



Conclusion

- NeMO: Object centric, geometrically changeable representation
- Training free object onboarding in seconds
- Constant inference cost while allowing online learning
- Allows geometric priors
- Online Object surface reconstruction
- State-of-the-art model-free ...
 - Detection
 - Segmentation
 - 6DoF Pose estimation

Try it yourself!

