



Large-Area Spatially Aligned Anchors

Joni Vanherck, Lode Jorissen, Ishtar Vandebroeck, Brent Zoomers,
Eric Joris, Nick Michiels

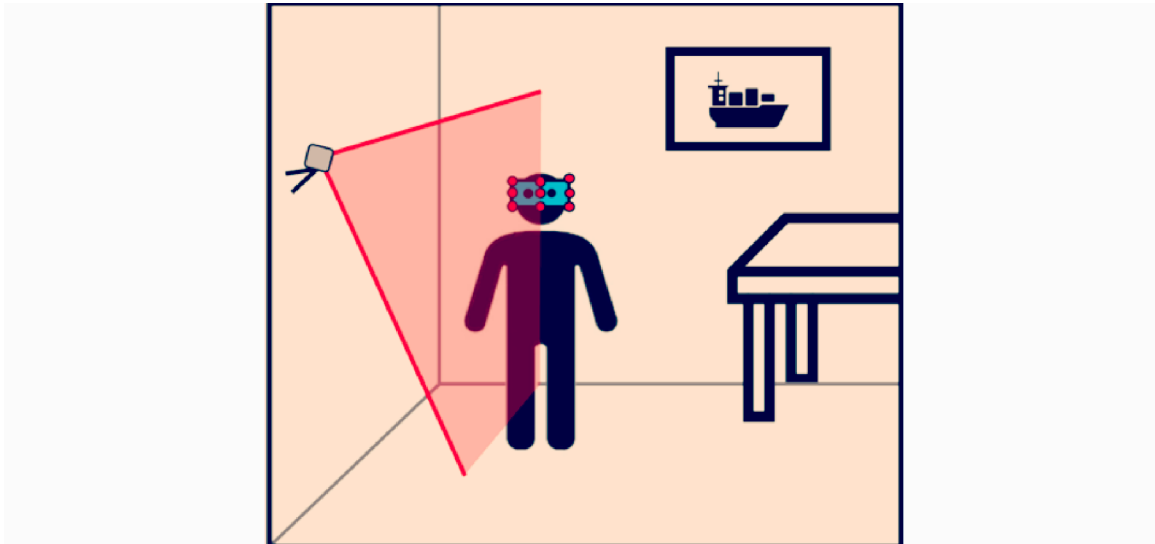
Speaker: Kristof Overdulve

Co-location

The physical and virtual spaces are aligned either by placing virtual objects on physical attributes in AR or by enabling VR experiences where virtual elements correspond to physical ones.



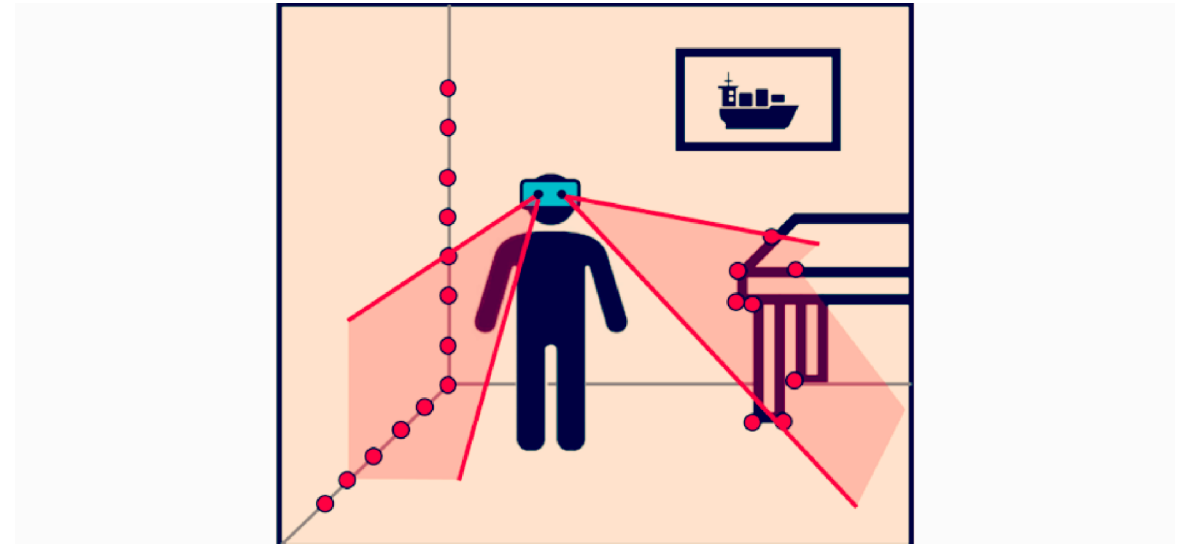
Localization in XR



Outside-in tracking

Headset localisation facilitated by external sensors (cameras, optical base stations, acoustic trackers, ...)

- + Accuracy
- Costly
- Requires modifications to the physical environment



Inside-out tracking

They require keeping tens of thousands of animals in a small space.

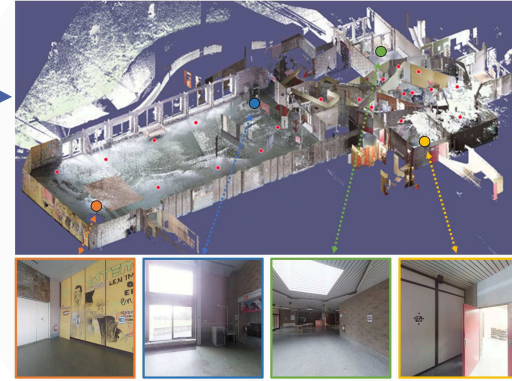
- + Cheap
- + No/minimal modifications to the physical environment
- **Prone to drift accumulation**



ORB-SLAM

Still some drift
Distortion over long distances

$(x, y, z, \phi, \theta)_{\text{ORB-SLAM}}$



Laser scan for ground truth physical geometry.

Used for:

- Aligning physical and virtual content
- Global optimisation of ORB-SLAM map with ground truth Aruco markers and keyframe features

$(x, y, z, \phi, \theta)_{\text{undist}}$

Headset localisation

$(x, y, z, \phi, \theta)_{\text{headset}}$

Prone to drift

Kalman filter

Drift correction

$(\Delta x, \Delta y, \Delta z, \Delta \phi, \Delta \theta)$

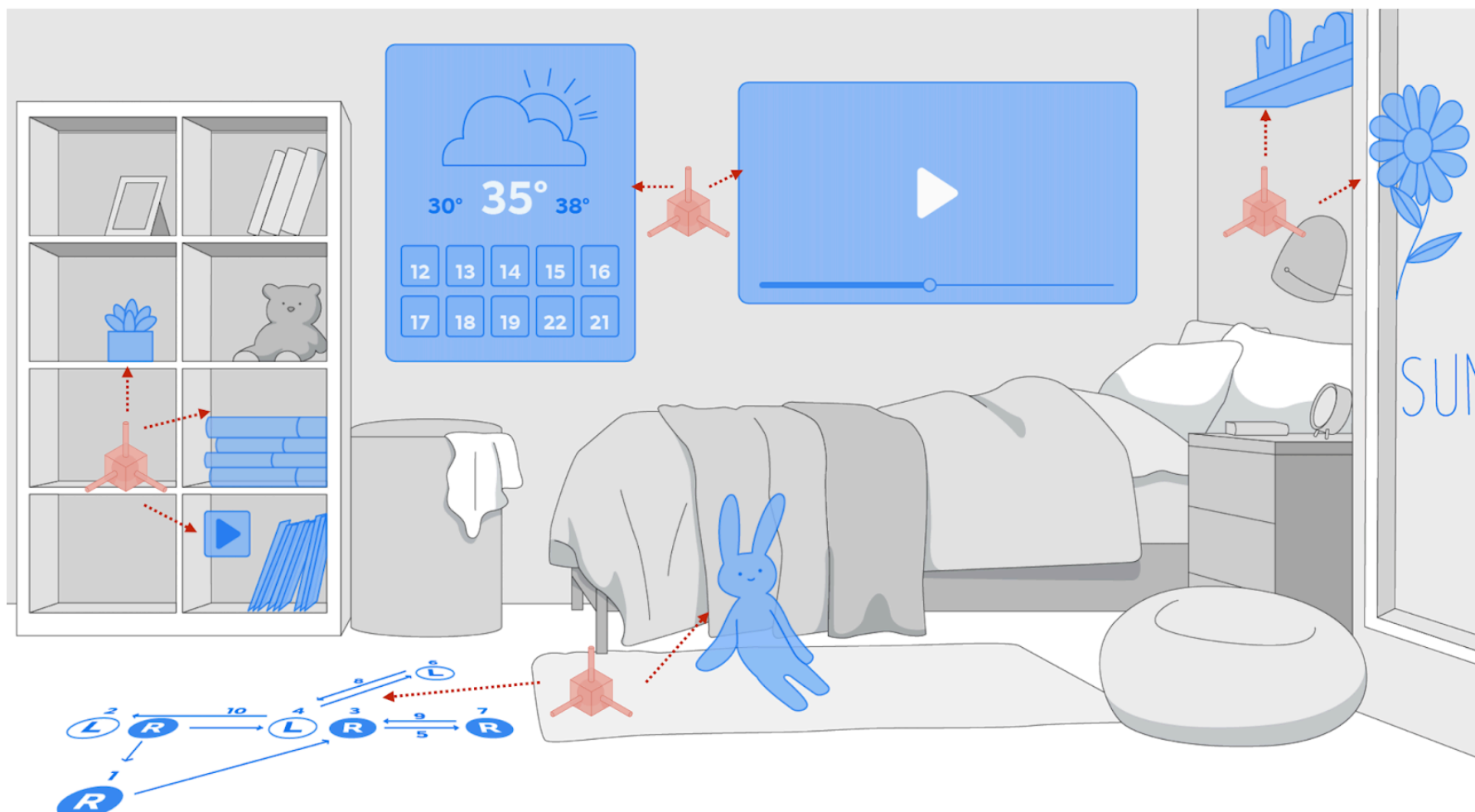
Tracking and Co-Location of Global Point Clouds for Large-Area Indoor Environments

Michiels Nick, Jorissen Lode, Put Jeroen, Vandebroeck Isjtar, Joris Eric & Van Reeth Frank

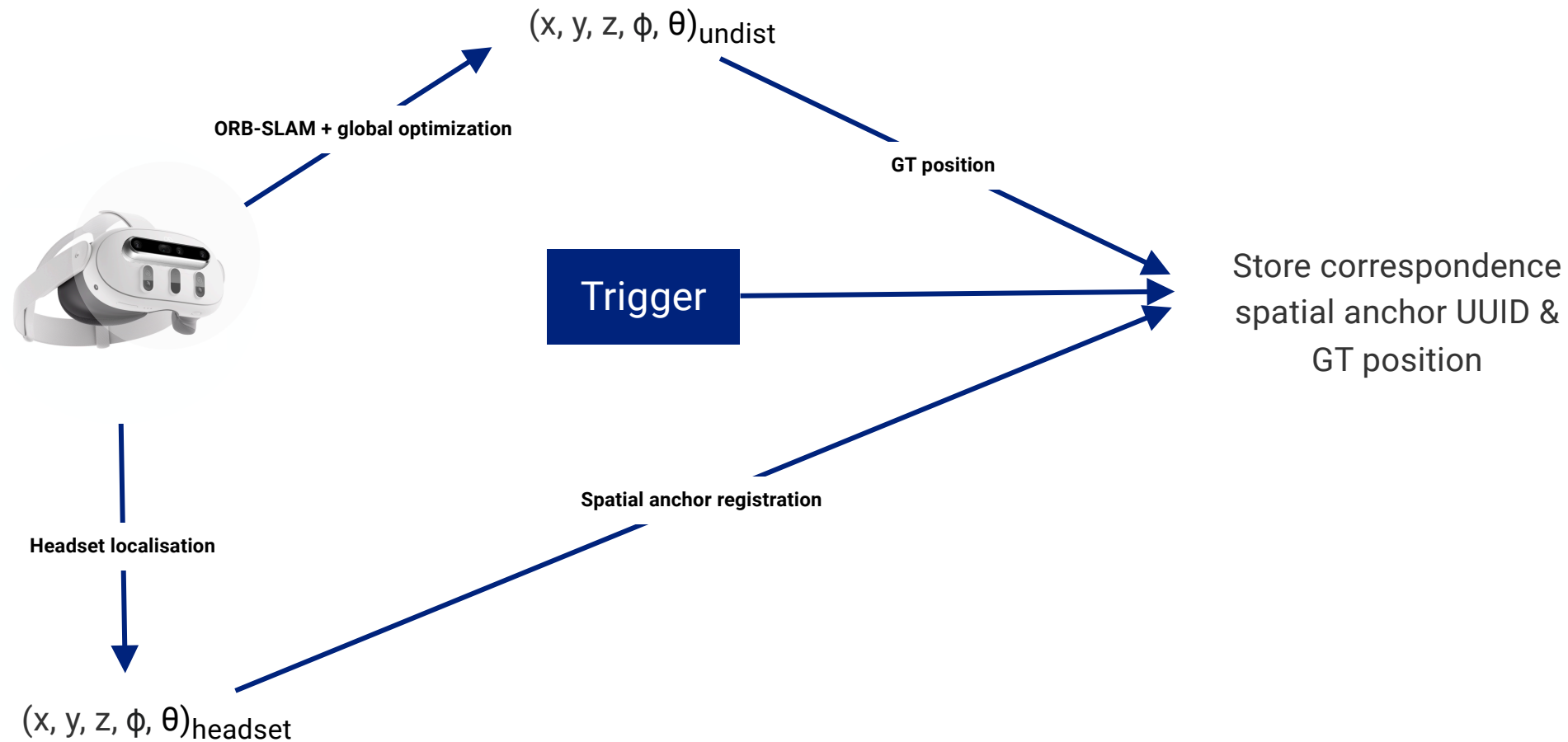


Spatial anchors

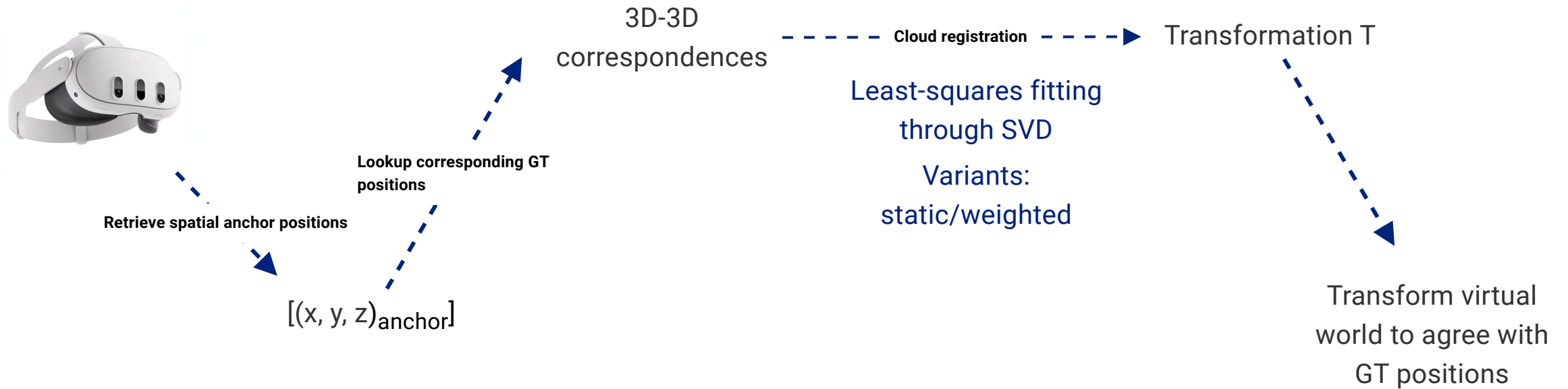
Spatial anchors are SDK features supported by many popular headsets. They allow recording reference points in the physical world that are tracked and corrected for drift. They are typically used for AR to keep content "in-place".



Preparation phase



Operational phase





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J. Vanherck, B. Zoomers, L. Jorissen,
I. Vandebroeck, E. Joris, N. Michiels

Conclusion

What

Scalable solution to mitigate drift and improve tracking accuracy over large areas.

Convenient

Full standalone functionality during the operational stage.

Plug-and-play

As external tracking methods improve, our method improves along with them.

Open-source

Unreal plugin available at <https://github.com/EDM-Research/UE-LASAA>.