

ALVAR – Serious AR

ALVAR is a suite of products and SDKs for creating augmented reality applications. ALVAR provides leading tracking technology that can be leveraged to add value to products and services, solve industrial problems and enable next generation tools. ALVAR customers include software developers, major product manufacturers as well as corporate users.

ALVAR TRACKING SDK

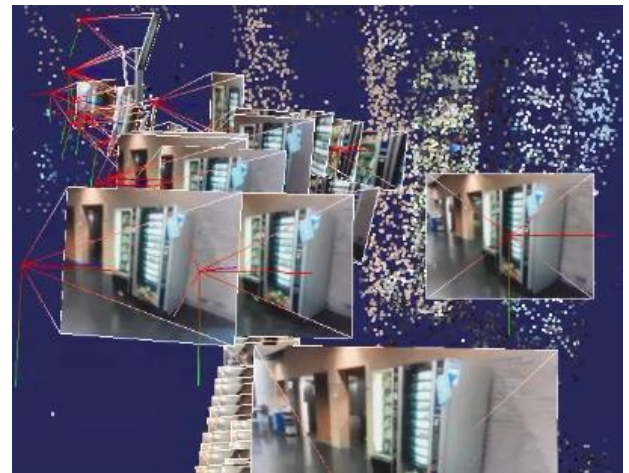
ALVAR is “a library for virtual and augmented reality.” The ALVAR SDK allows you to create AR applications with the most accurate, efficient and robust implementation for marker-, 2D image-, and 3D point cloud-based tracking. ALVAR provides a low-level C++ API to its tracking algorithms and includes several tools that assist in the creation of AR applications. Its low-level interface makes it possible to develop custom solutions that can be integrated with existing products and services.

ALVAR 2D SDK

- Tracks 2D targets, markers and images
- Accurate, fast and robust, also handles occlusions
- Pose optimization and perspective projection
- Multi-marker tracking with automatic calibration
- Image matching and template-based tracking
- Diminished reality

ALVAR 3D SDK

- Markerless, feature-based 3D tracking
- Based on point clouds created from photos of target
- Most accurate, fast and reliable 3D tracking available
- Automatic initialization without user interaction
- Robust against occlusions, changes in environment, lighting conditions
- Covers wide areas, dynamic loading of point clouds, optimal performance using edge servers
- Panorama tracking with semi-automatic initialization
- Extended tracking, SLAM, sensor fusion



ALVAR 3D tracking is based on point clouds created from photos of the tracking target. Point cloud tracking enables the implementation of accurate, fast and robust AR applications, covering multiple targets and wide areas.

ALVAR Studio

- Unity-based AR content authoring platform
- Support for animated 3D models, images, annotations
- Align AR content with tracking targets, markers, images, point clouds
- Various tools for point cloud editing and optimization

Platforms

- Mobile: Android, iOS, Windows Phone
- Desktop: Linux, Windows, Mac

INDUSTRIAL SOLUTIONS

ALVAR Industrial covers applications from industrial maintenance to assembly and training. ALVAR solutions enable the use of AR in demanding and complex industrial environments—helping customers improve their operations and business with measurable benefits.

Industrial Operation

- Maintenance, assembly and training
- 3D model-based augmented instructions
- Assists untrained workforces in remote locations
- Instructs on complex or rare equipment, and complex and/or frequently changing tasks
- Visualizes assembly or repair sequences for new workers

Remote Maintenance

- Annotated instructions produced by an expert at home office, shown to remote worker in AR view
- Expert interacts with 3D CAD model or photos of target
- System captures expert's gestures and annotations
- Augmented instructions are displayed in real time at remote site
- Works over low bandwidth, even in demanding conditions



ALVAR Tracking enables the most efficient and robust applications for both indoor industrial and outdoor AEC applications.

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AEC & WIDE AREA SOLUTIONS

ALVAR AEC covers applications in the AEC (Architecture, Engineering and Construction) field ranging from city planning to facility asset management. ALVAR solutions enable building managers to view IoT data and decision makers to view buildings on-site prior to construction.

Facility Asset Management

- Provides information of building's structure, equipment and processes in real-time AR view
- Mobile AR interaction with Building Information Models (BIM) and other facility information
- Integration with facility maintenance systems, building automation systems and IoT
- Enables interaction with digital data, "X-ray vision", seeing targets behind walls
- Covers wide areas, using automatic point cloud acquisition and updating methods

City Planning, Real Estate, Tourism

- Visualizes planned buildings on-site in live AR view
- Allows the comparison of alternate plans or designs
- Takes video and photos of augmented view
- Handles occlusions by foreground buildings and landscape
- Accurate tracking based on point clouds or hot spots
- City planning, building renovation, real estate customers
- Consumer and tourist applications, points of interest, photos of city history



Further information

VTT AR & 3D Tracking Research
www.vtt.fi/multimedia
www.youtube.com/user/VTTAugmentedReality