



AUGMENTED
PIXELS

SLAM 3D Maps Worth More Than Google Maps

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2017

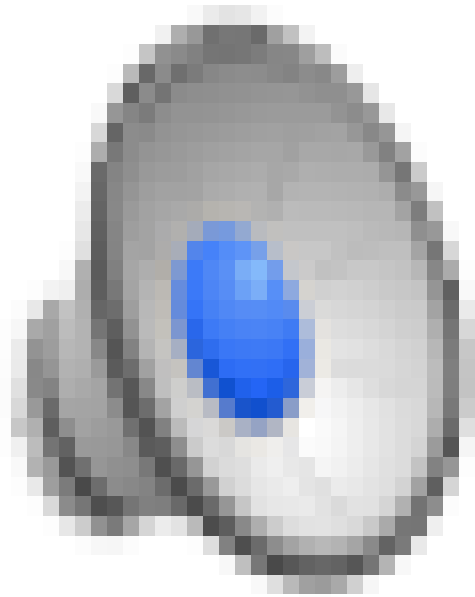
Proprietary Technology Stack:

- Mapping, Point Cloud;
- Visual SLAM for Mono / Stereo Camera;
- Sensor Fusion(Gyro + Accelerometer);
- Loop Closure, Recovery;
- Scene Semantics;
- Support of additional sensors like Sonar and LiDAR;
- Cloud infrastructure for Maps;

Performance:

120 fps on iPhone 7, 65 FPS on Odroid C2 2 Cores, 47 fps on Raspberry Pi 3.

3D MAPPING

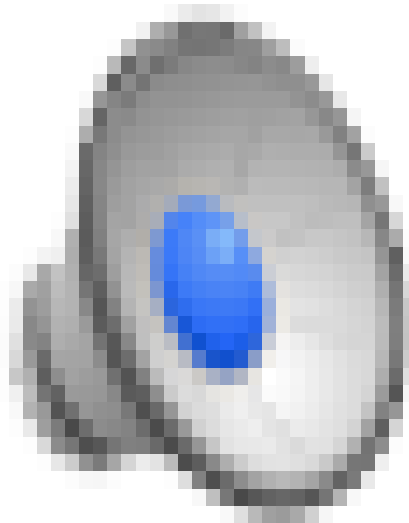


Tracking

Performance ~ 120 FPS on iPhone 7



Autonomous Navigation



Autonomous Navigation



Inside Out Tracking for AR Glasses

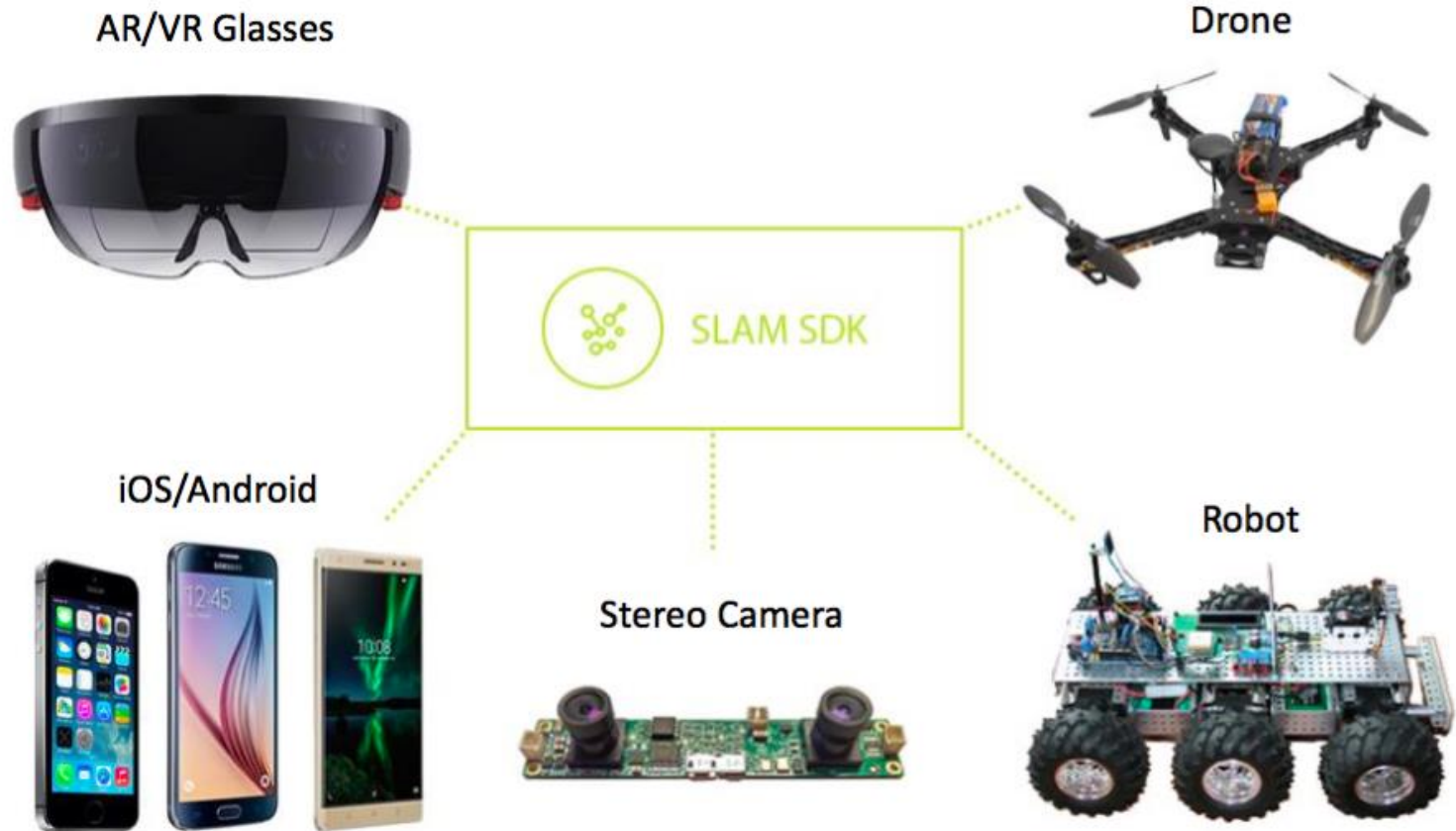


Autonomous Navigation & Inside Out Tracking Modules

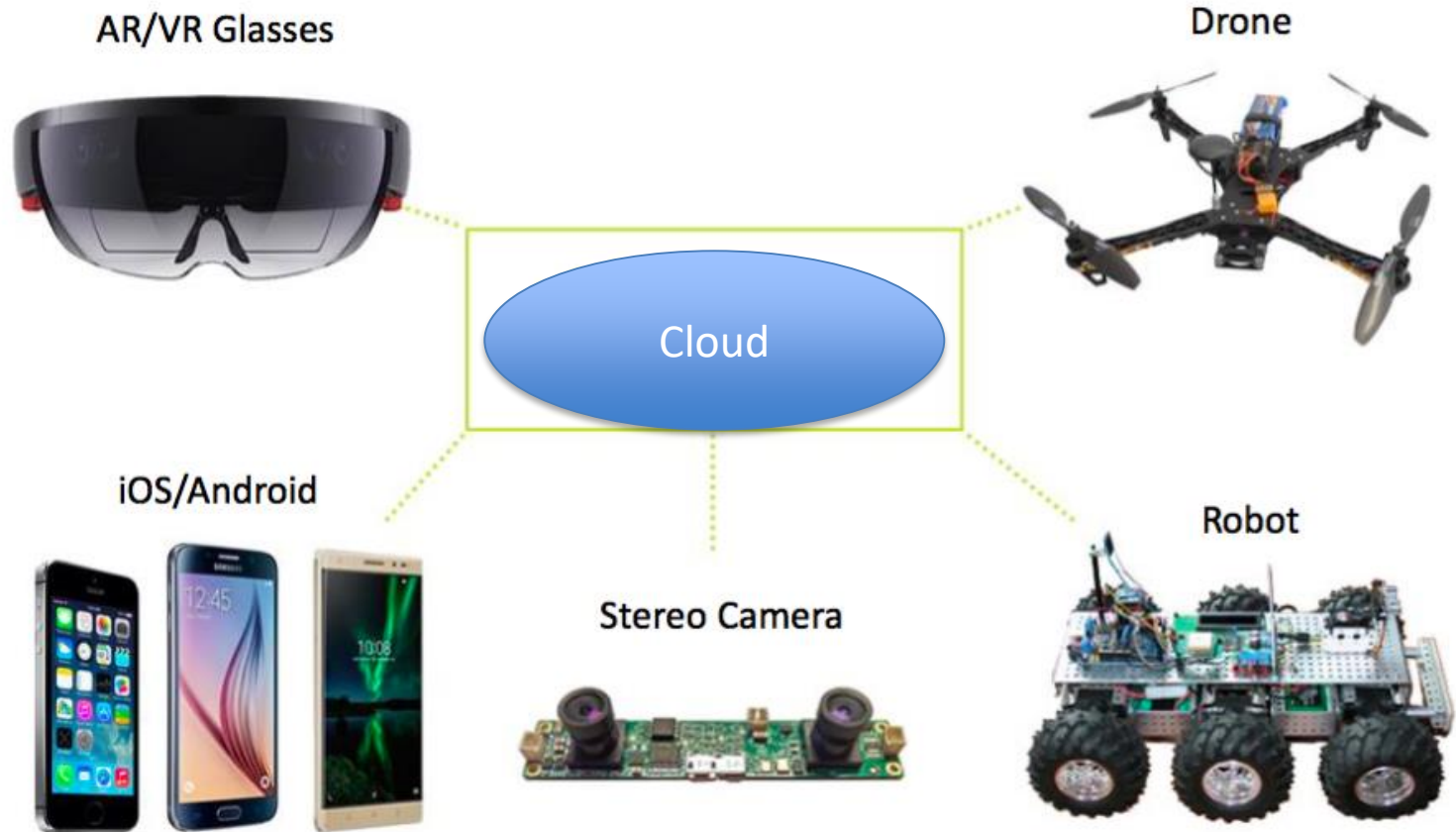
Stereo / Mono(fisheye) + IMU + Raspberry Pi 3

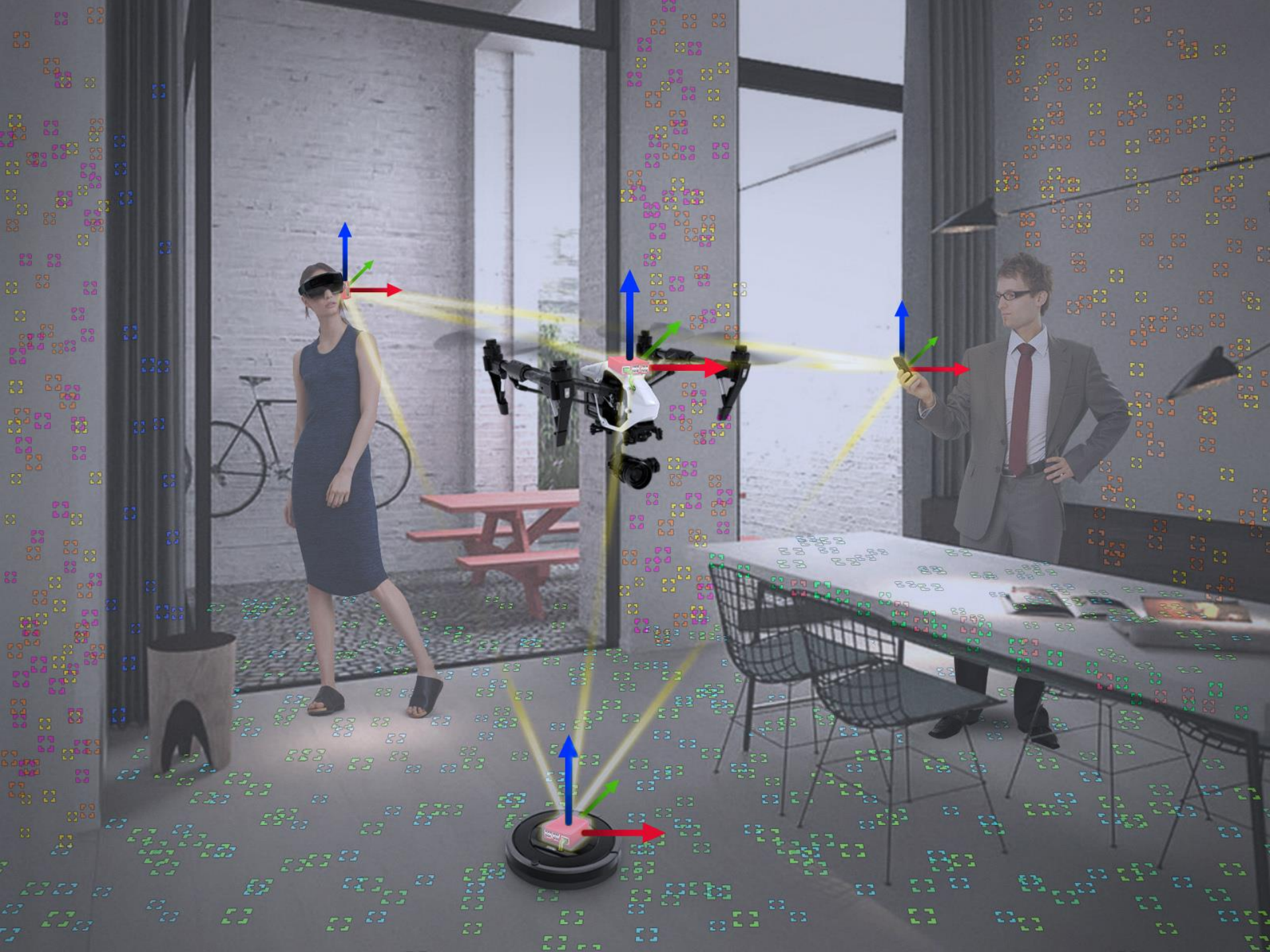


Platforms



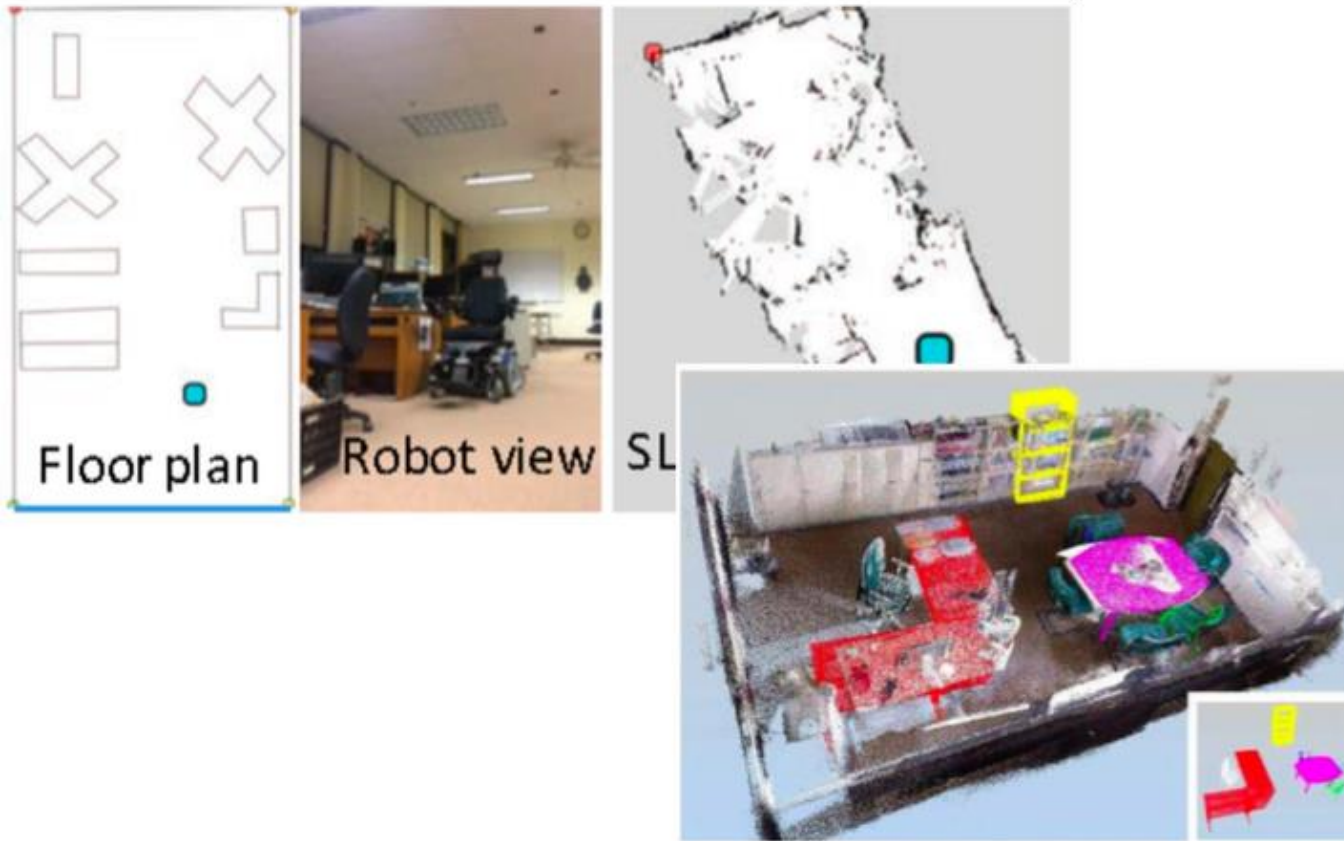
Cloud infrastructure





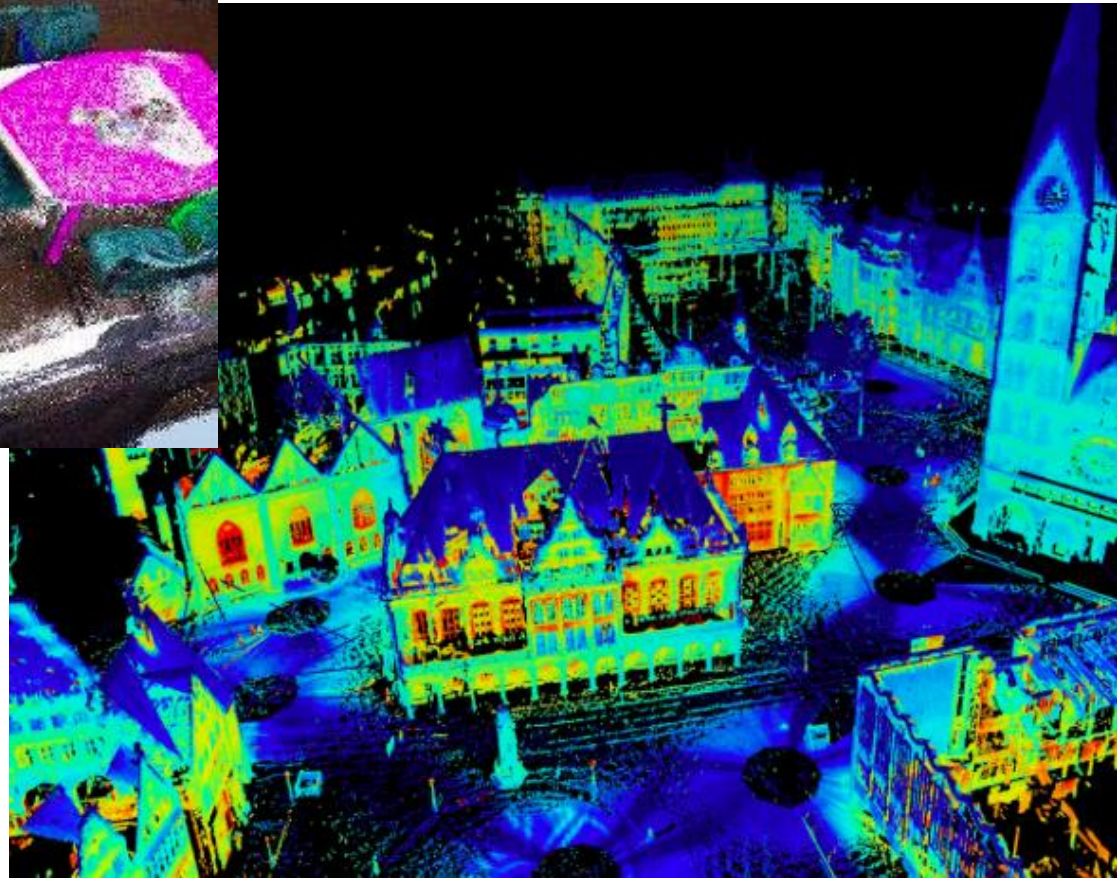
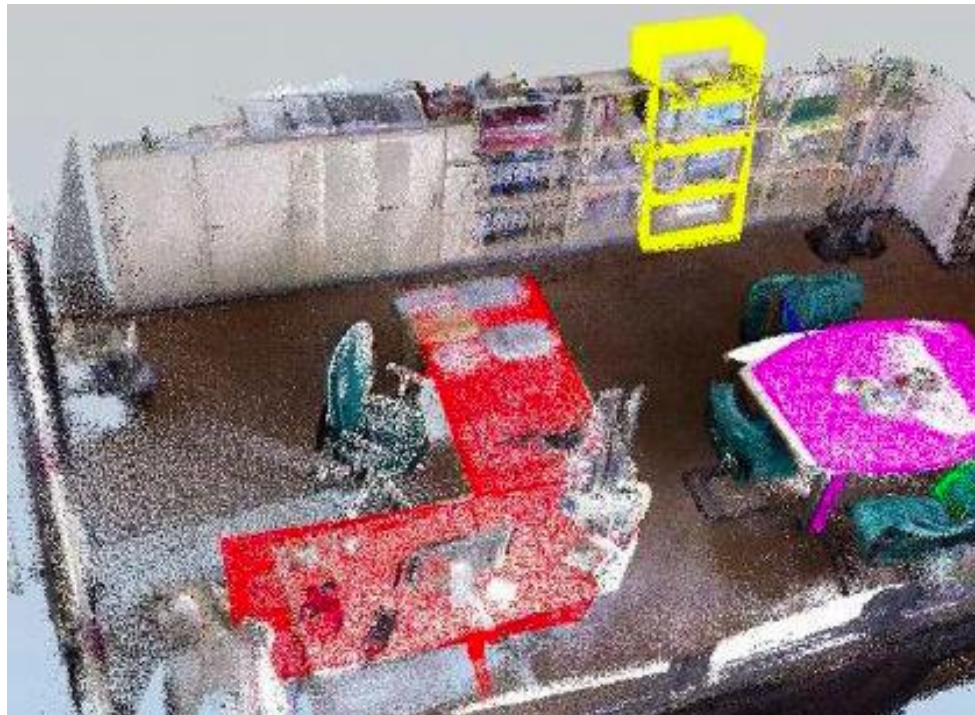
R&D

Analytics



- Collision avoidance
- Segmentation
- Classification
- 3D semantics

Indoor Maps + Outdoor Maps



Human <-> 3D MAPS <-> Robot



- Interfaces
- Standards and protocols
- Real time algorithms for maps merging and analytics

Future

AR Glasses = new “iPhone”



Autonomous Cars & Trucks



- Level 4/5 autonomy in 2020-2025
- No human labor
- The number of accidents is predicted to go down 80% by 2040

Autonomous Drones



100% Autonomous:

- Delivery (food, products, etc.)
- Inspections
- Surveillance
- Warehouse inventory management

Agriculture



100% Autonomous:

- Sowing
- Harvesting
- Animal farms cleaning
- Remote inspections & monitoring

Construction



100% Autonomous:

- Delivery (food, products, etc.)
- Inspections
- Surveillance
- Warehouse inventory management

Warehousing



1. Amazon has 45,000 robots (Kiva)
2. Market size: \$10bn by 2020
3. 50-99% decrease in labor costs for:
 - Inventory management
 - Indoor shipments

Conclusion

- Accuracy < 1 cm(vs GPS' 6 meters);
- Improvement of current patterns of behavior (autonomous navigation, etc.);
- Creation of fundamentally new services, patterns of behavior;
- Accumulation of fundamentally new knowledge, which will exceed the value of Google Maps in many times!



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