AI 영상 인식 및 처리 플랫폼 개발과 응용/상용화 동향

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목차

1. 컴퓨팅 환경의 변화

현대인의 생활 환경의 변화 – IoT with AI

NEST

Google Home

Amazon KIVA

Amazon PrimeAir

Google Glass

IoT with AI

Google Car

MS Hololens

BMW Mini Augmented Vision

Olli

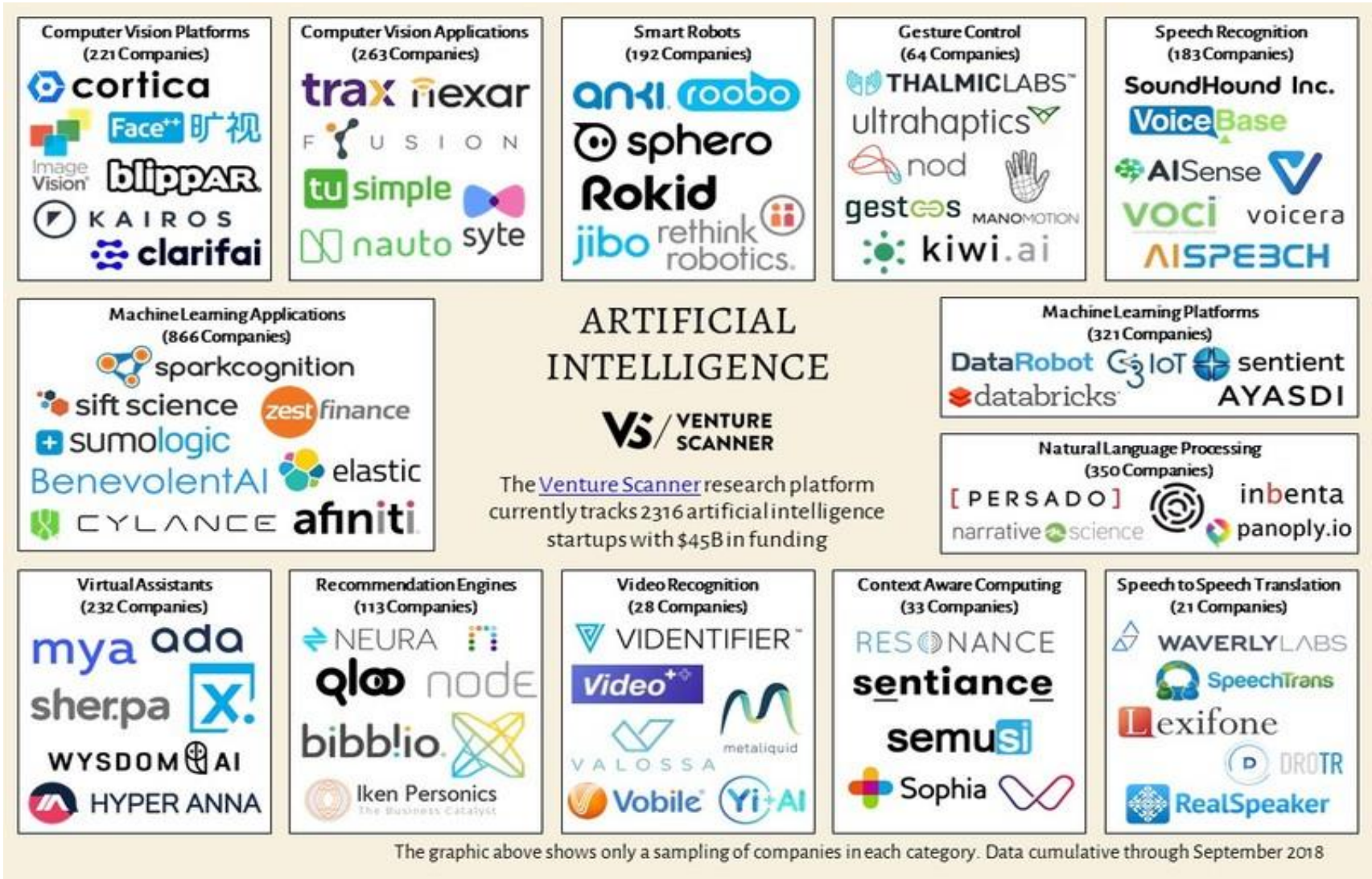
컴퓨팅 환경의 혁신적 변화

- Computer Network (Wireless Communication)의 눈부신 발전 - 5G 상용화
- AI 기술의 산업화 – Disruptive business

  (Deep Learning, Big Data, Knowledge Graph, NLP, Computer Vision,…)
- Smart Glasses (Major global players : Apple(iGlass), Google(Google glass), Microsoft(Hololens), Facebook, Amazon(Alexa))

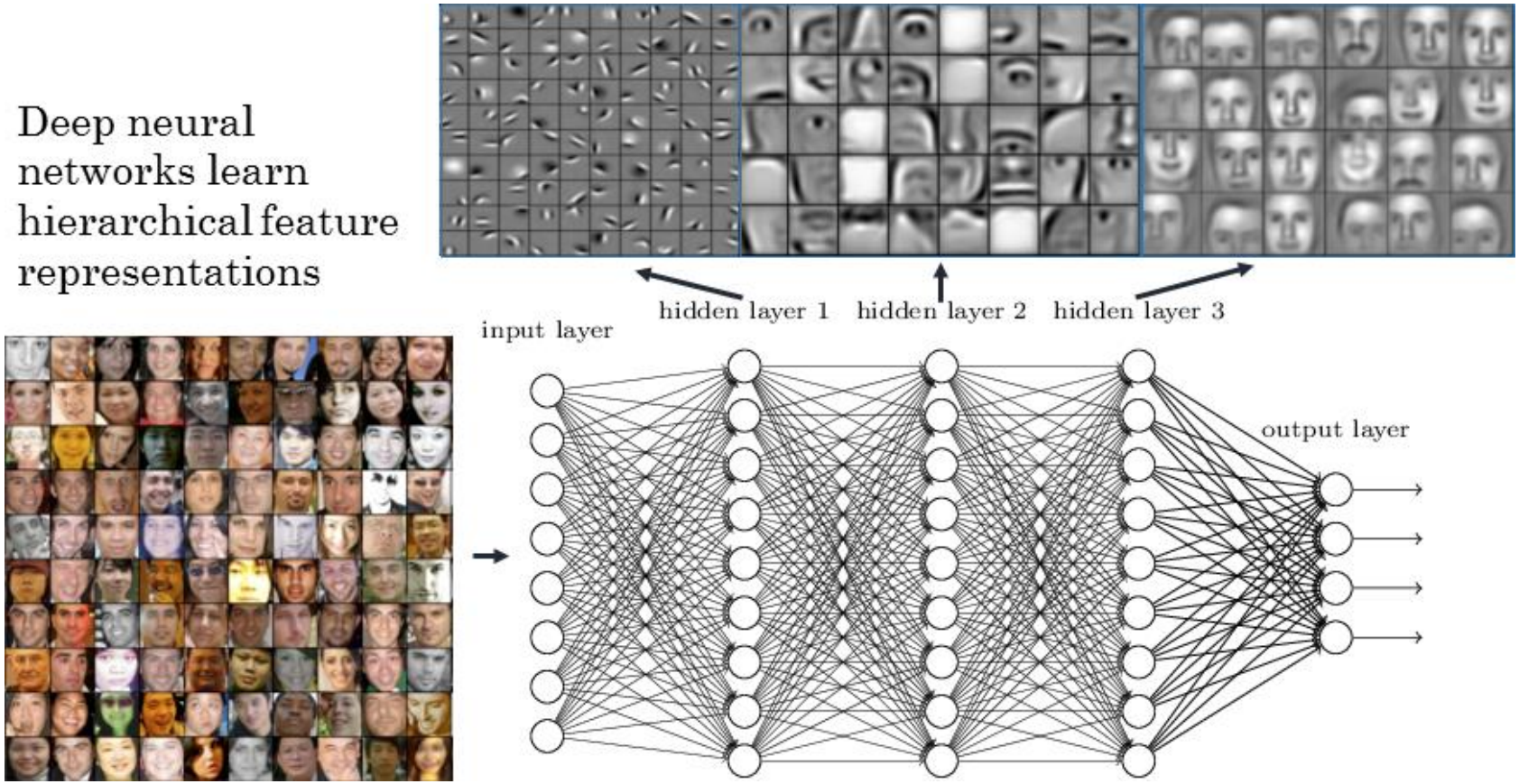
출처: 조선일보 Tech&Biz(2017.10.28)

인공지능 기술의 산업화 - AI Startup



Feature in Deep Learning

- CNN learns features and classify the images

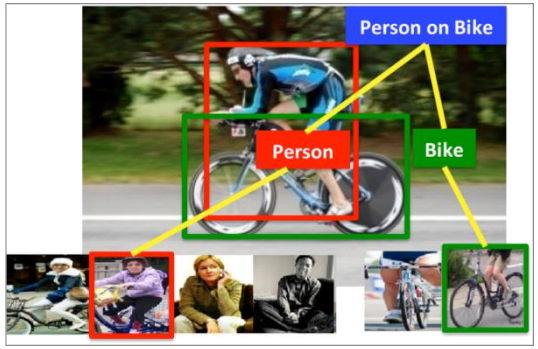


[출처] Deep Learning and Convolutional Neural Networks: RSIP Vision Blogs

Deep Learning

- Object Recognition
  - Finding and identifying objects in an image or video sequence
- Image Classification
  - Assigning an input image one label from a fixed set of categories
- Image Segmentation
  - Partitioning a digital image into multiple segments (sets of pixels)
- Object Tracking

Will computer pass Video Turing Test ??



Object Recognition

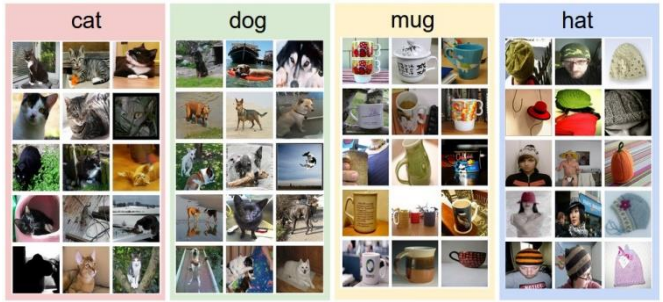


Image Classification

Image Segmentation

2. 비젼 기술의 산업화

Smart Glasses

Entertainment

SONY SmartEyeGlass
[Source : sonymobile.com (2017)]

DreamGlass
[Source : Dreamworld (2017)]

MAD GAZE
[Source : madgaze.com(2017)]

Next Glasses of facebook
[Source : mashable.com(2017)]

SOLOS Smart Glasses
[Source : solos-wearables.com(2018)]

Microsoft Hololens
[Source : Microsoft(2016)]

Magic Leap
[Source : Microsoft(2018)]

Vuzix Blade
[Source :
vuzix.com(2018)]

Industrial use

DAQRI Smart Glasses
[Source: DAQRI(2017)]

Google Glass Enterprise Edition
[Source: x.company(2017.08)]

ODG R-7HL Smartglasses
[Source: ODG(2016)]

Industry-standard authentication (ANSI Z87.1)
Certified by the Pentagon(810G)

Epson MOVERIO Pro Smart Headsets
[Source: xinreality(2017)]

Mixed Reality

VR과 AR, 그리고 MR

- **VR(Virtual Reality)** : 현실과 유사한 체험을 할 수 있도록 구현된 가상의 공간(그래픽 처리 기술)
- **AR(Augmented Reality)** : **현실에** 3차원 가상 이미지(영상)를 **겹쳐서** 보여주는 기술
- **MR(Mixed Reality)** : 현실과 홀로그램(가상 입체영상)을 겹쳐서 보여주는 기술로 여러 사람이 공유하여 볼 수 있음

LG 360 VR


AR : 영화 아이언맨

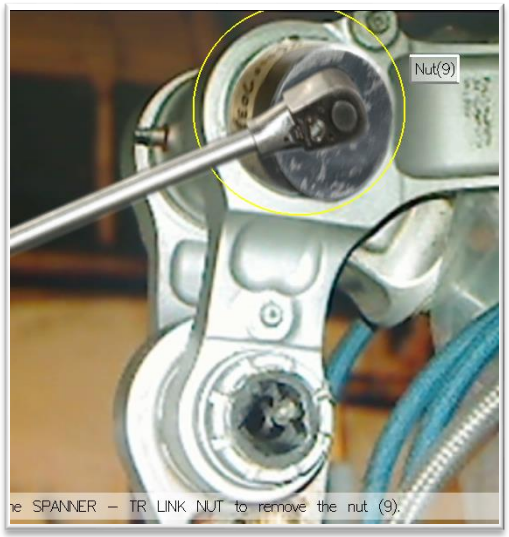

Magic Leap사의 MR 시연

Mixed Reality

Physical World

Digital World

Mixed Reality



Reference: G. S. Jo, et. al., A Unified Framework for Augmented Reality and Knowledge-based Systems in Maintaining Aircraft, IAAI/AAAI 2014

Camfind

[출처] http://camfindapp.com/

증강현실(AR) 기술의 산업화 – Fraunhofer IDM

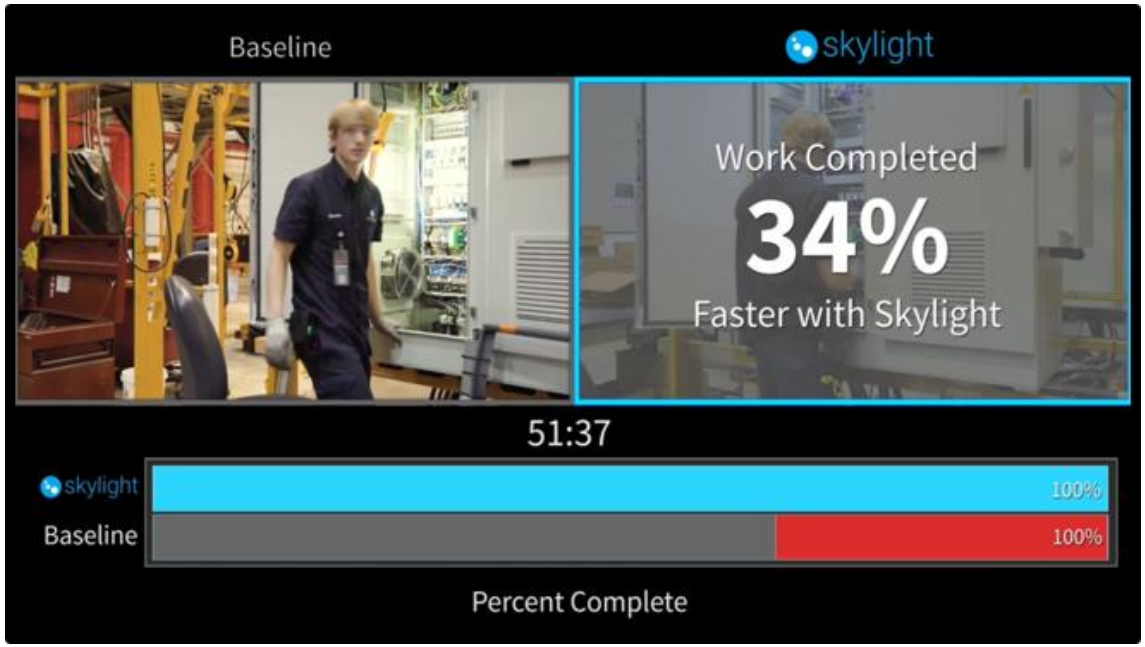
- AR Mobile Prototype(2012)
  - Engine Maintenance using Augmented Reality

VR/AR 기술을 활용한 Training – Japan Airlines

- 2015년 8월부터 마이크로소프트사와 공동으로 연구 진행
- Microsoft HoloLens를 활용한 정비사 교육 훈련용 시제품의 데모

증강현실(AR) 기술의 산업화 – UP.Skill

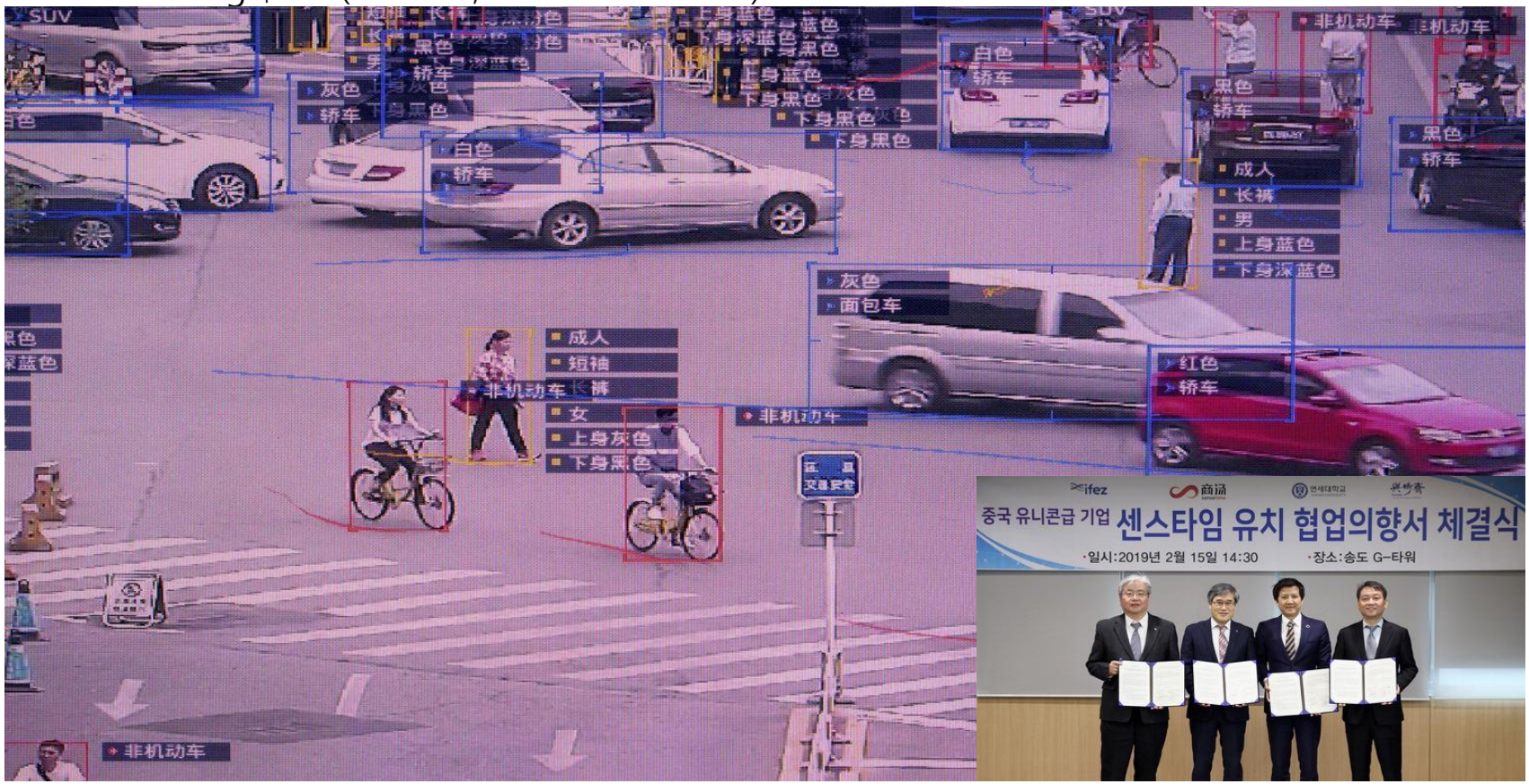
- AR기기를 통한 원격지원 기능, 이미지/동영상 원격 공유, 작업지시 문서 제공
- 원거리상의 기술자와의 영상 공유에 의한 원격 기술지원과 ERP상의 정보 및 작업 지시서 제공
- Case Study : Prototype을 통한 효율성 검증
  - –GE Healthcare : 주문목록의 pick & packing 작업에 46% 생산성 향상
  - –GE Renewable Energy : 풍력 터빈 탑 박스 배선 작업 효율성 34% 향상



SRI International – AR Mentor

Bloomberg Businessweek : SenseTime

- SenseTime is helping build China's Panopticon(감시 시스템)
- Aims to bring its smarter-camera-everywhere model
- Total Funding $2.6B(Series D, Founded in 2014)



The Moscow Times – ‘CCTV 카메라가 모스코바에서 채무자들을 찾아 낼것 이다’

- 174,000 CCTV cameras expected to be in operation in 2018,
- 사회문제 해결 - ‘personal loans in Russia grew to 8.6 trillion rubles ($130 billion)’.

AR/AI 기술의 산업분야 응용

Military

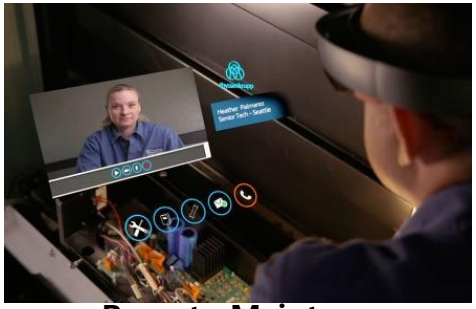
Smart Factories

Automobile
Management & Support

Training & Education

Smart Farms

Smart Home



Remote Maintenance

Medical

Semiconductor Plant

3. Computer Vision with Knowledge

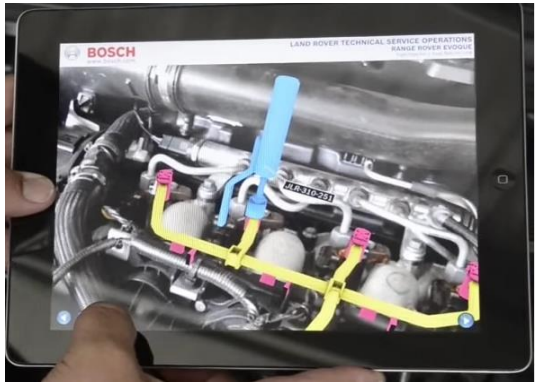
Computer Vision without Knowledge

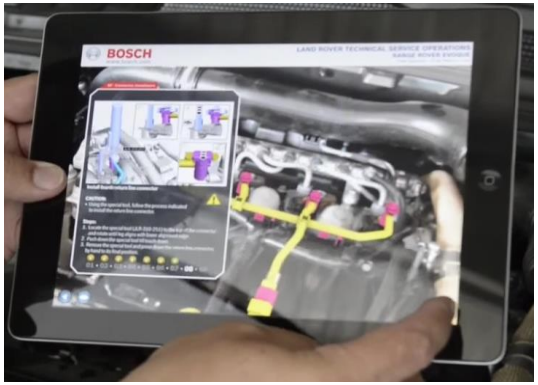
AUGMENTED KNOWLEDGE
www.augmentedk.com

- ARMedia (2013)



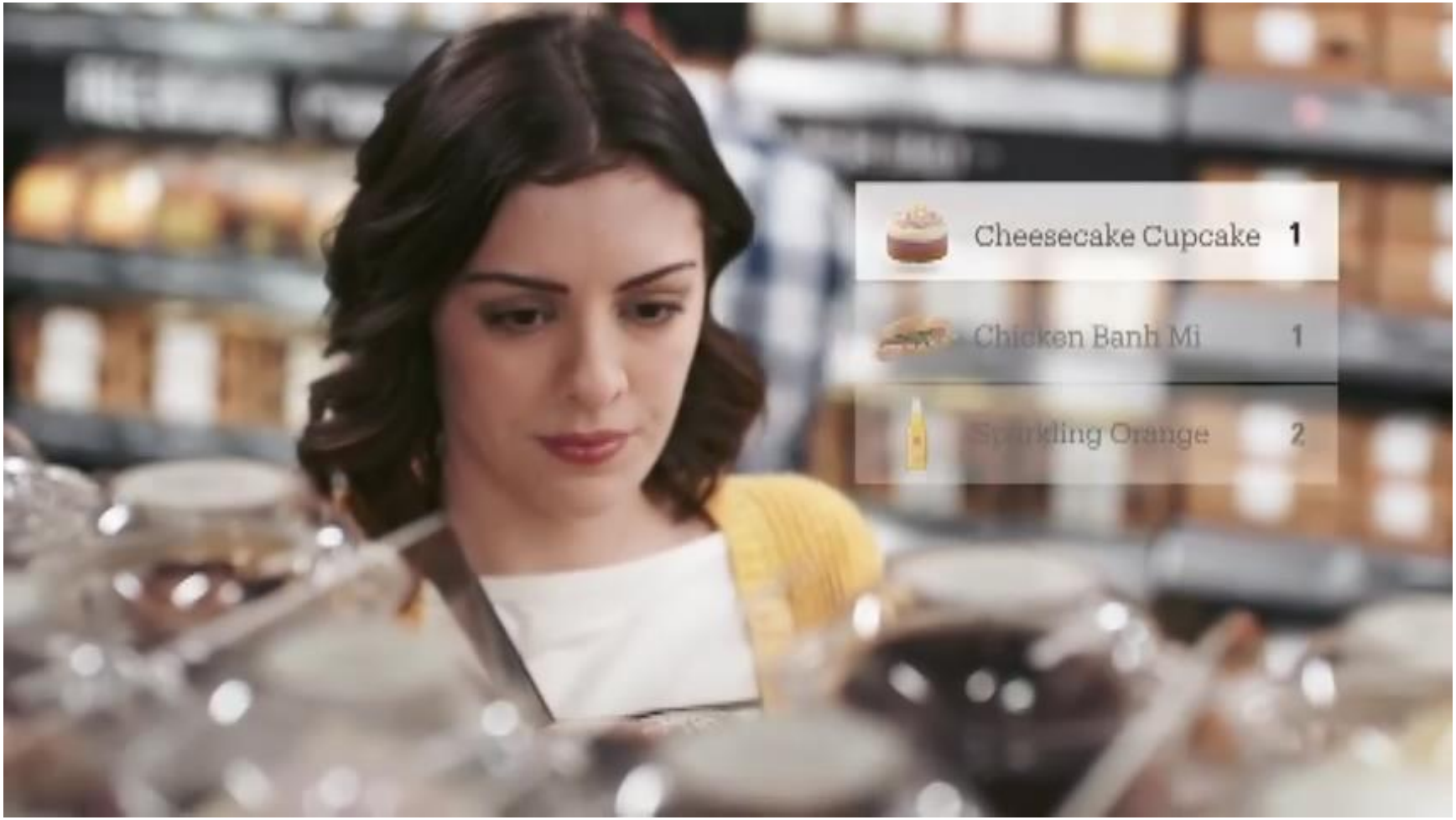
- BOSCH and RE'FLEKT (2014)





DARPA Mind's Eye

Amazon Go – 무인 수퍼마켓



AK Platform – 자동차 엔진

AUGMENTED KNOWLEDGE
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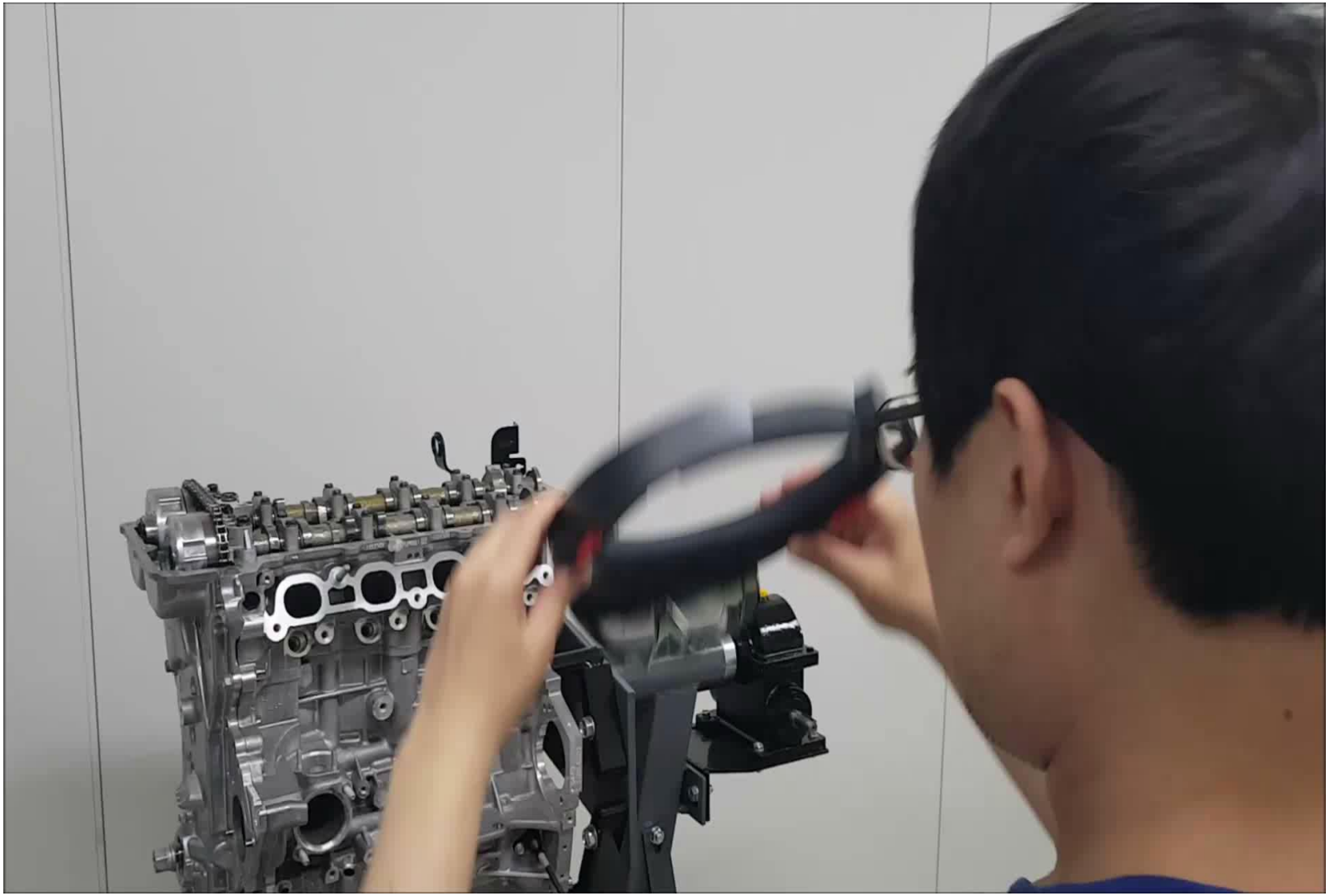
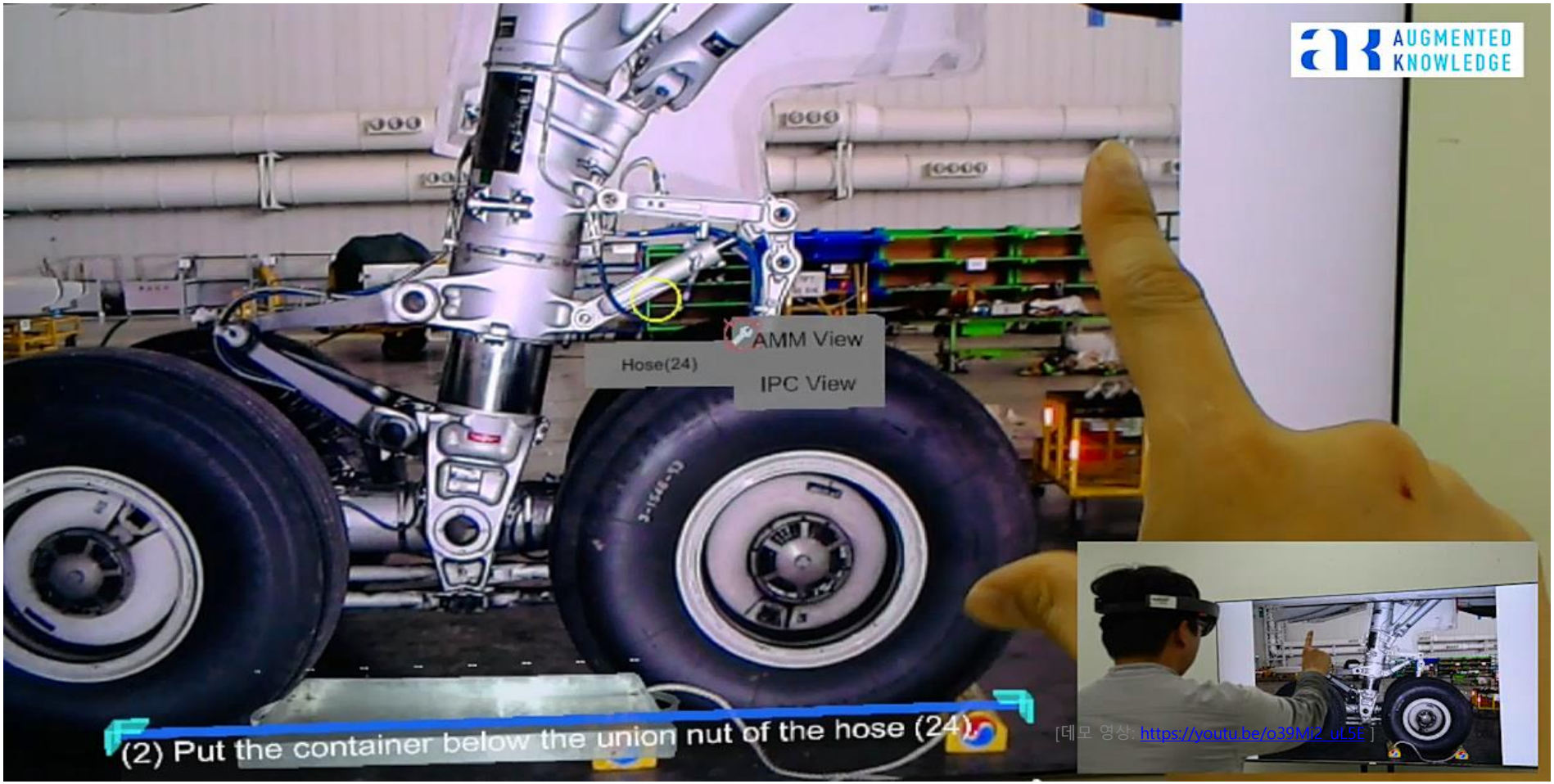


AK Platform – 항공기 정비

비디오 데모 - Aircraft Maintenance with HoloLens



$480 million HoloLens Contract from US Army

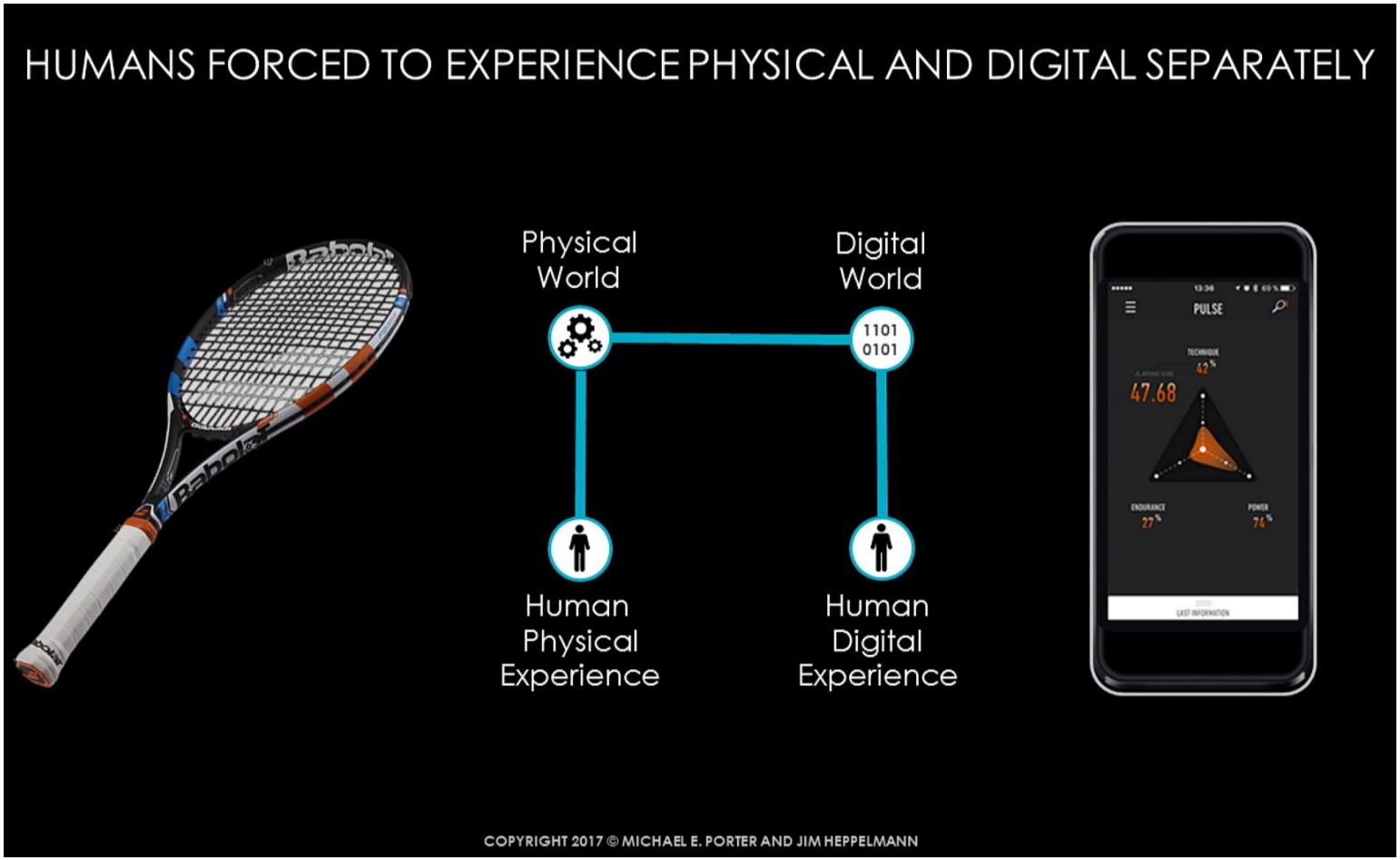
“Integrated Visual Augmentation System (IVAS) prototypes.”

Microsoft Wins $480M Contract to Provide HoloLens to US Military

•By Joel Hruska on November 30, 2018 at 9:31 am

“Augmented reality technology will provide troops with more and better information to make decisions,” a Microsoft spokesman told Bloomberg in an emailed statement. “This new work extends our longstanding, trusted relationship with the Department of Defense to this new area,”

More on AR & IoT - Tennis Racket



Reference: Jim Heppelmann(CEO of PTC), AR & IoT – Better Together! / AR in ACTION

4. 결어

- Computer Vision supported by Knowledge
- Context-aware Service – GPS, IoT Sensors, Automated Reasoning and Visualization
- AR Technology Support with 5G Infrastructure
- Technology Maintenance :
- Training with VR/AR Virtual Experience

감사합니다

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