AUTONOMOUS DRONE SOLUTIONS

WITH MICROSOFT'S AUTONOMOUS SYSTEMS PLATFORM

GUADA CASUSO - PAUL STUBBS- MIKE WISE

WE ARE LIVING IN AN AUTOMATED WORLD

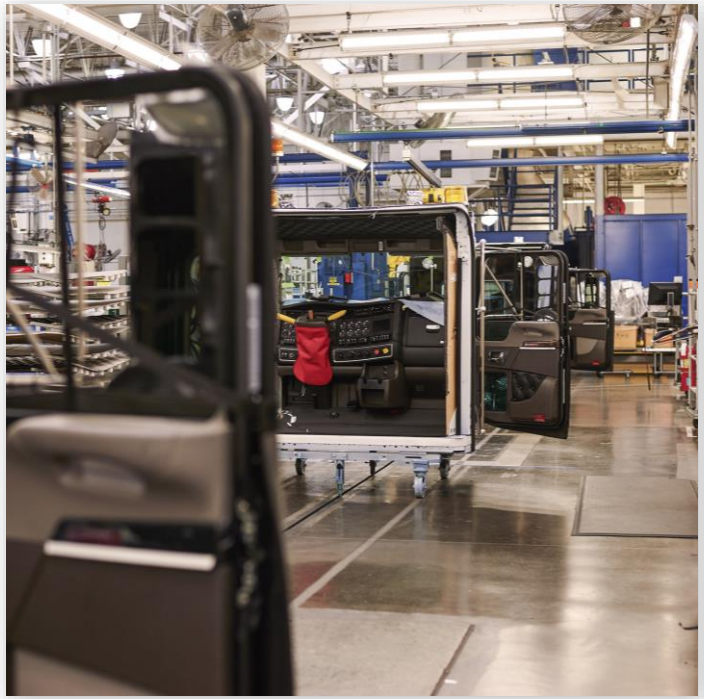
EVOLUTION OF INDUSTRIAL SYSTEMS

Mechanized systems

Powered by **steam or electricity**

Manually operated

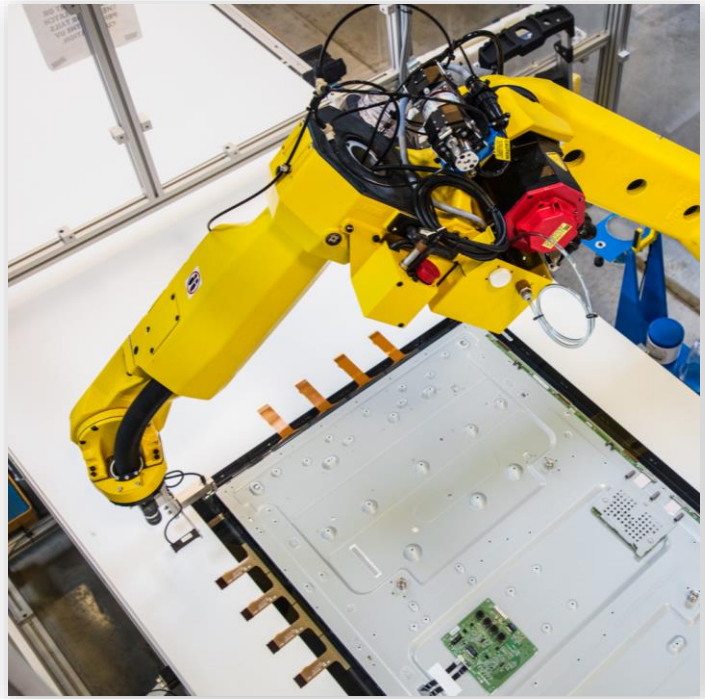
Automated systems



Powered by **software**

Fixed operation

Autonomous systems



Powered by **AI**

Intelligent operation (sense/plan/act)

EVOLUTION OF INDUSTRIAL SYSTEMS

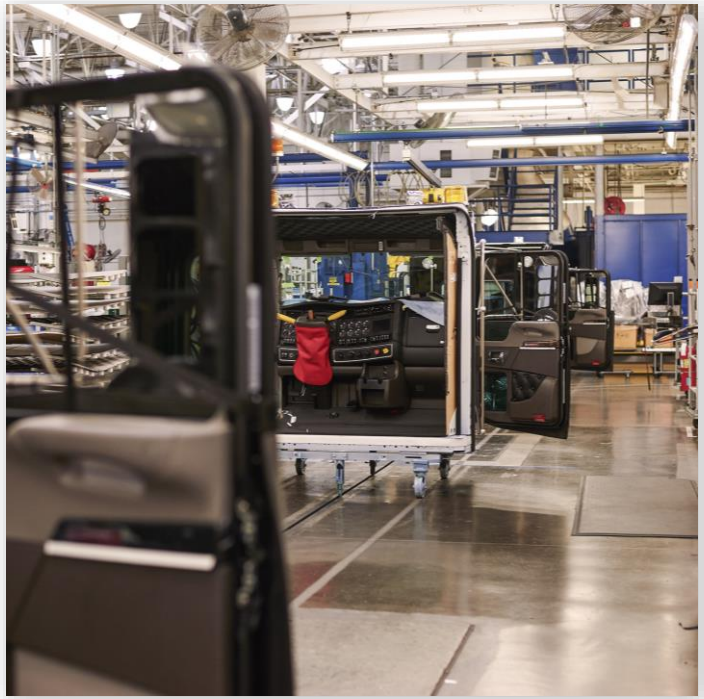
Manual systems

Labor intensive

Error prone

Difficult to scale

Automated systems



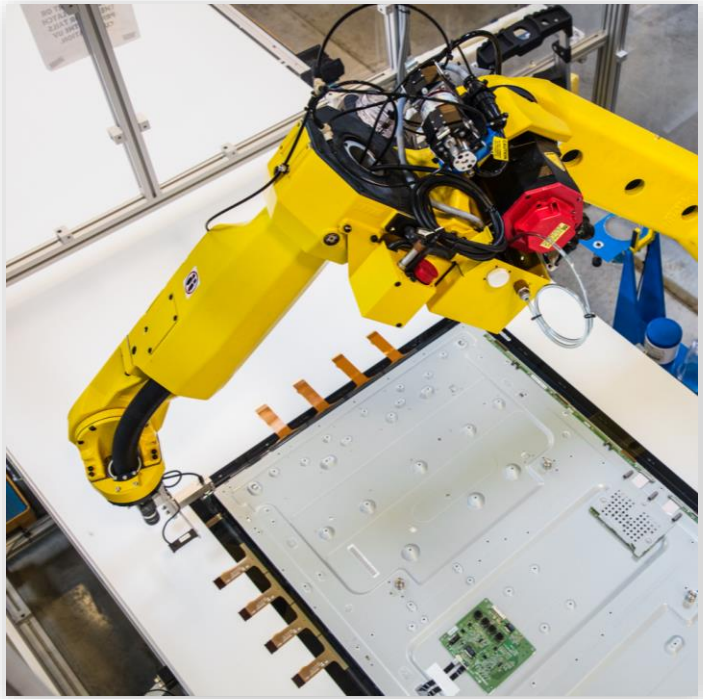
Task specific installations

Effective and scalable

Programmed behavior

Limited in scope and flexibility

Autonomous systems



Solve previously unsolvable problems

Robust and flexible decision making

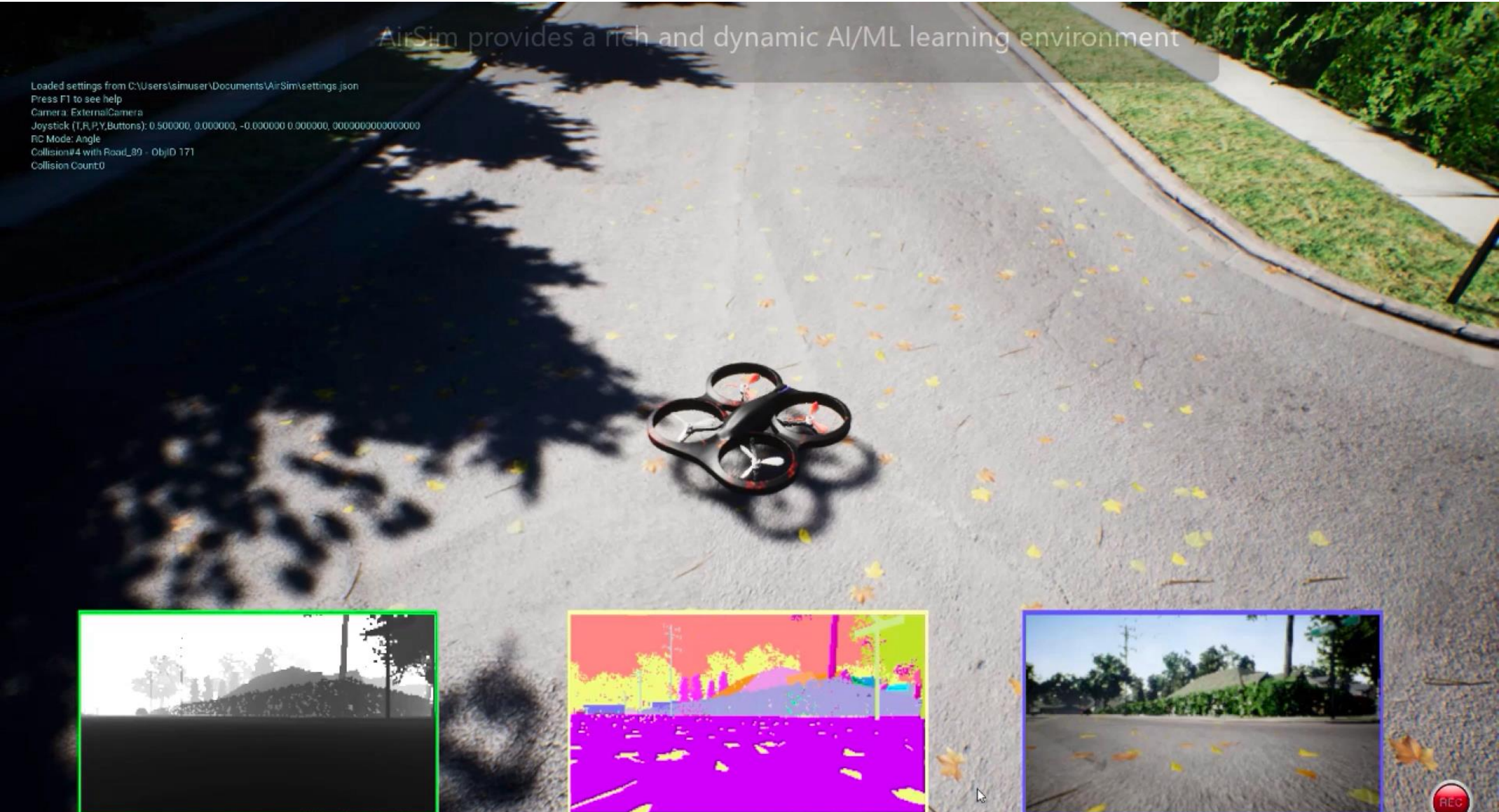
Learned policy

Human in the loop

DARPA SUBTERRANEAN CHALLENGE

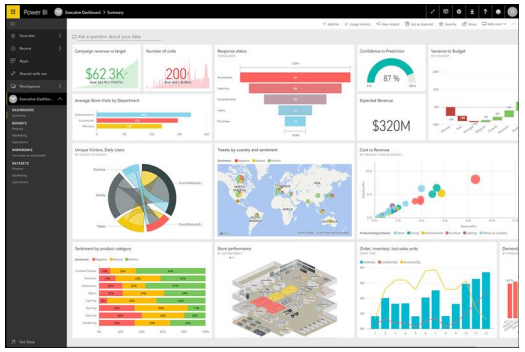
https://aka.ms/as/subt

SUBT PLATFORM


AirSim provides a rich and dynamic AI/ML learning environment
Loaded settings from C:\Users\simuser\Documents\AirSim\settings.json
Press F1 to see help
Camera: ExternalCamera
Joystick (T,R,P,Y,Buttons): 0.500000, 0.000000, -0.000000 0.000000, 0000000000000000
RC Mode: Angle
Collision#4 with Road_89 - ObjID 171
Collision Count:0
REC

DEVICES FOR STATUS/SIMULATION VISUALIZATION

Dashboard/ Laptop



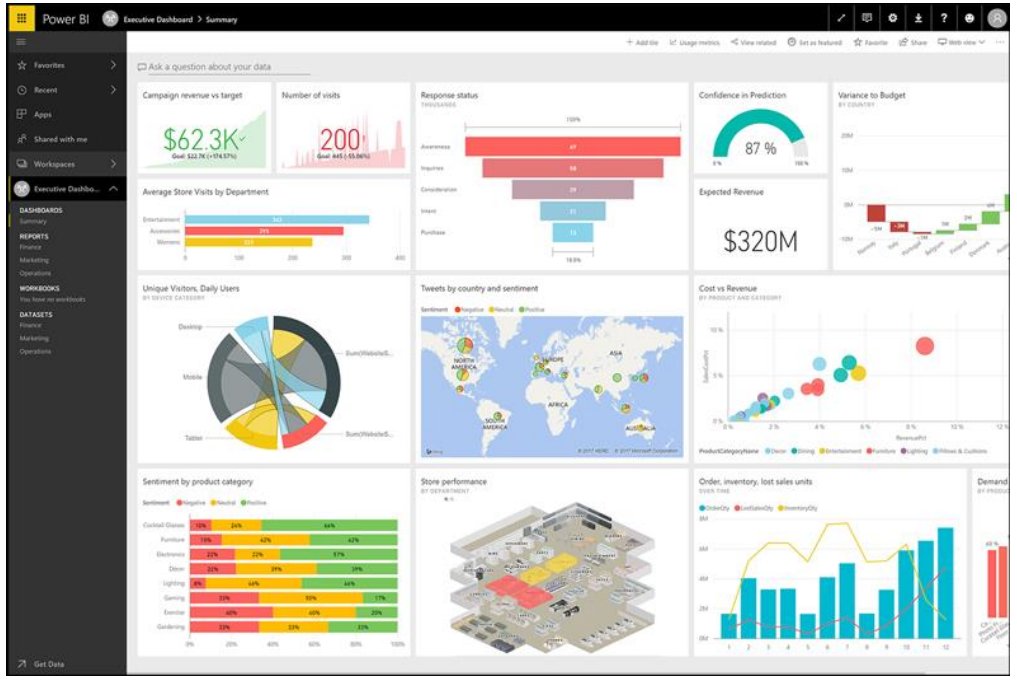
Annotated Reality

Virtual Reality

Mixed Reality

DASHBOARD/LAPTOPS

- State of the art today
- Mostly indoor
- Many solutions available
- Microsoft: PowerBI



ANNOTATED REALITY

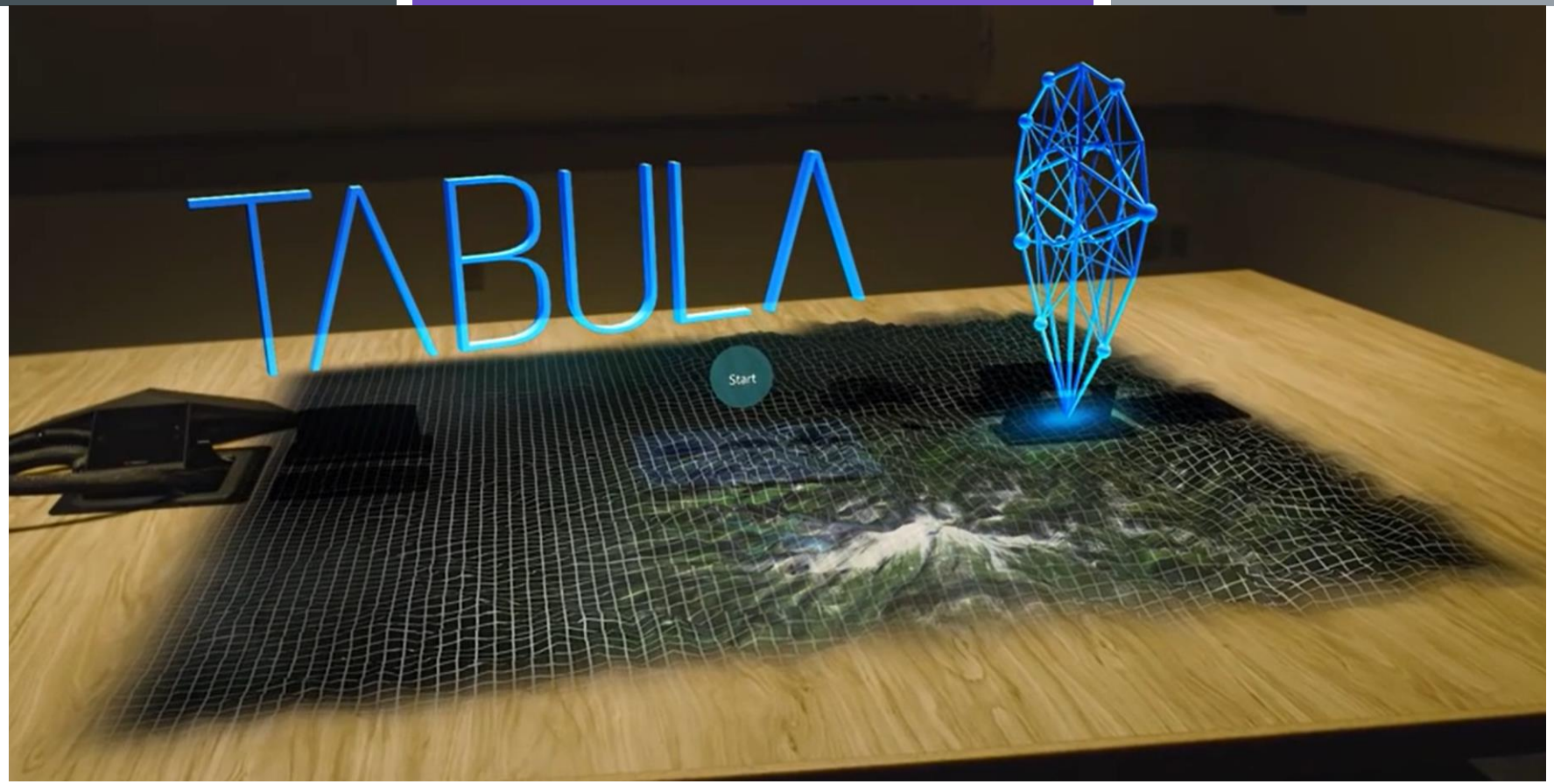
- Increasing acceptance
- Essentially head mounted tables
- Ruggedized outdoor solutions available today
- Rapid adoption, but not yet common
- RealWare device shown on left runs android

VIRTUAL REALITY

- Common in gaming world
- Indoor only because of total immersion
- Very useful for training
- Acceptance is limited outside of younger generation

MIXED REALITY

- Blended combination of reality and graphics
- By far the most difficult
- Seems magical ☺
- Will change our interactions with information
- Today not feasible in bright sunlight
  - Probably 5-10 years before this is possible
- US Army has massively invested in this technology (Project IVAS)
- Microsoft is the technology leader with the HoloLens - a second-generation device



TABULA:HTTPS://MSIT.MICROSOFTSTREAM.COM/VIDEO/14BE536C-4EBA-404F-818B-15FC3A6E16B9?CHANNELID=27D34495-409D-40CD-86A3-3BB8B05A3990

Microsoft