Progressing a healthy digital future

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Topics

Microsoft in Healthcare
Emerging Technologies in Digital Health
Engaging Tech Industry

Microsoft – In Health

Empower care providers

Engage patients and consumers

Optimise operations

Reimagine healthcare

Research

Technology

Partners, Collaborations & Partnerships

Modern workplace

Teams for Health

Business applications

CRM Health Accelerator (FHIR)

Applications, infrastructure

Azure API for FHIR, FHIR server

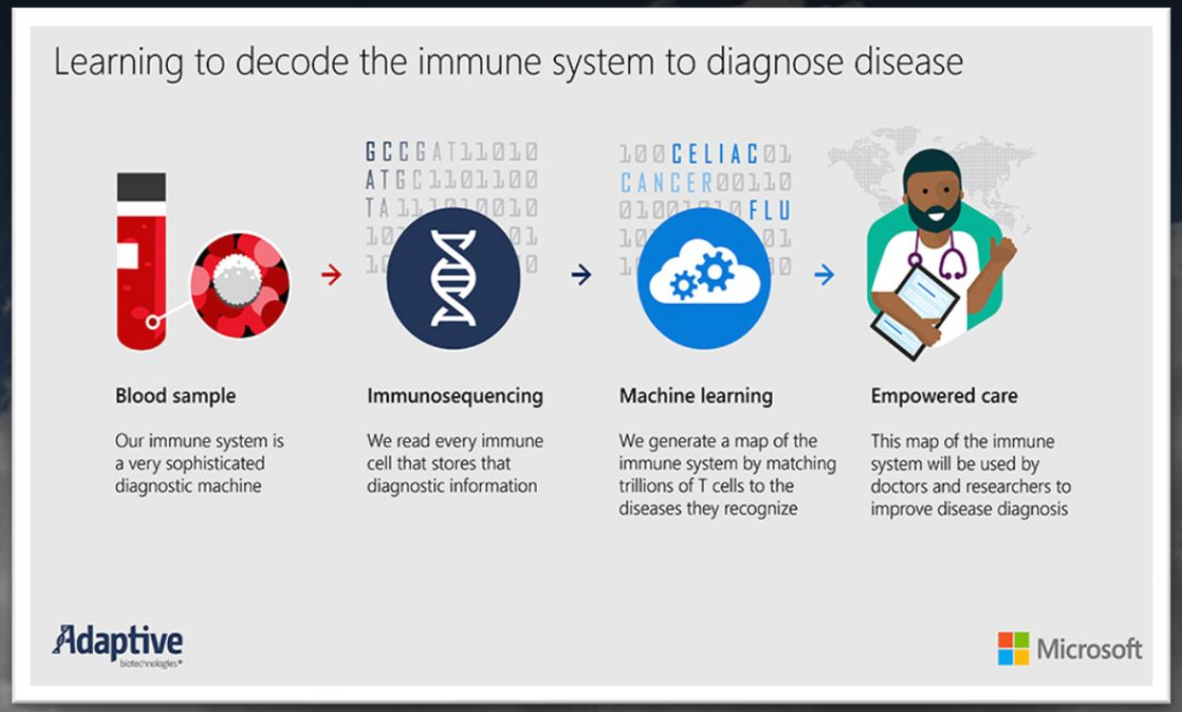
Data & AI

Health Bots HoloLens

Security, Skills and Training, Start Ups, Responsible AI

Enabling Digital Health Research

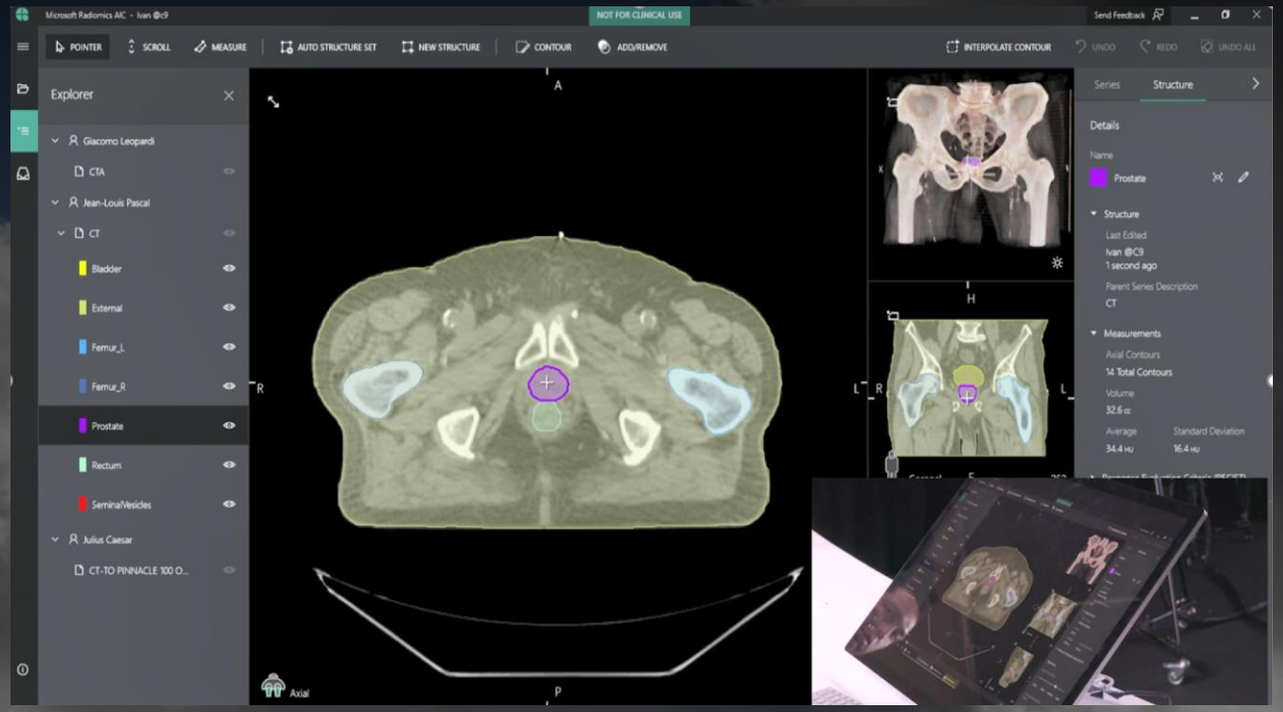
Bioinformatics research



Adaptive Biotechnologies & Microsoft Healthcare

T-cell Receptor immunogenomics for diagnosis
Training data – 1 trillion data points / year

Medical Imaging AI

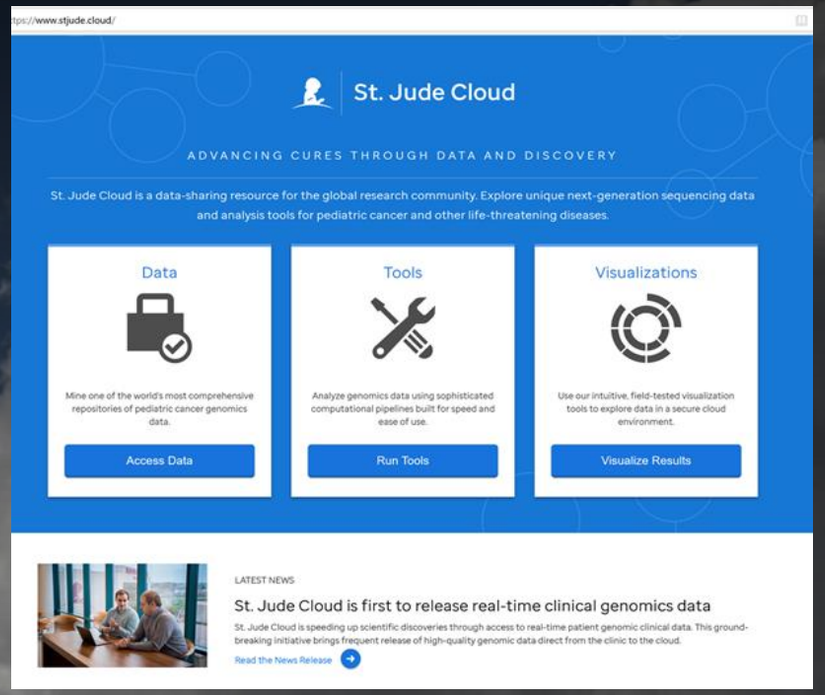


Microsoft Healthcare Project InnerEye

Radiomics for tumour organ segmentation
FDA Class II approved

Enabling Clinical Research at Scale

International genomics research collaborations

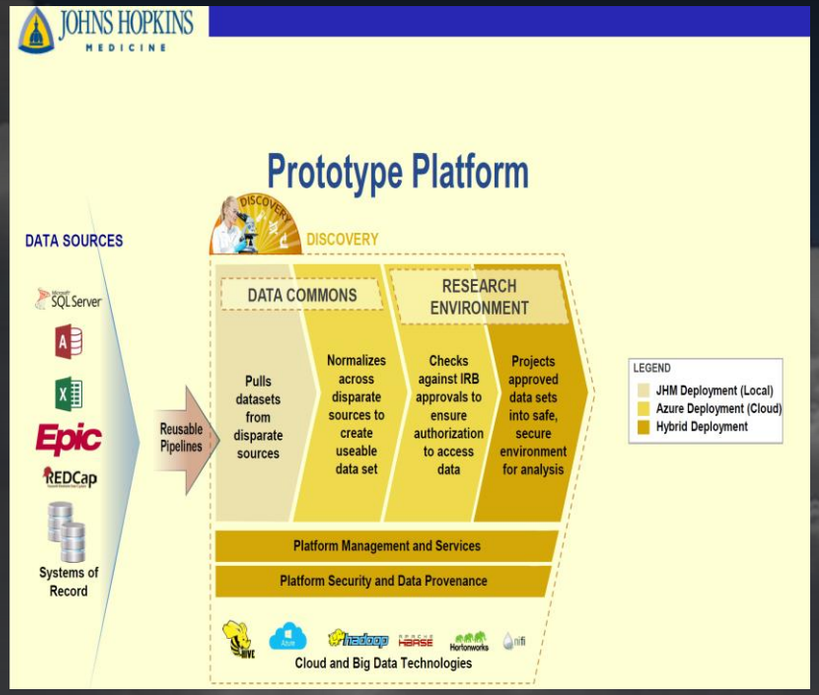


St Jude, USA

St Jude Cloud

2,000 clinicians, 300 organisations, 28 countries

Precision medicine research



Johns Hopkins, USA

Precision Medicine Analytics Platform

EMR, physiologic, image data

Prostate cancer, MS, cardiac arrhythmia…

Genomics research

ANU, Australia

John Curtin School of Genome Science

HPC computing. 3D structure of the genome in cancer cells

Connecting medical devices (PoCT)

Medical IoT

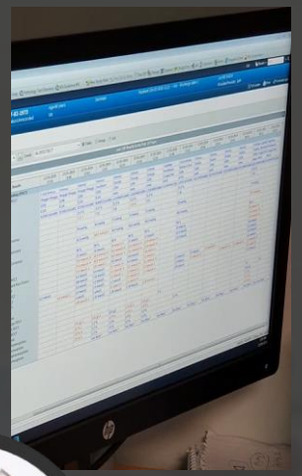
Challenge

↑ in PoCT machines (600 of 20+ types)

↑ in provisioning, managing, credentialing

Results not flowing back into EMR

How technology is helping



NSW Health Pathology PoCT hub – Raspberry Pi based hub with 4G to connect PoCT and LIS

End to end test - INR result to EMR 35s (IoT)

Phase 1 – pilot starting in 6 locations incl. Hunter New England, Western Sydney and Murrumbidgee LHDs

Phase 2 – Vitals data, Early deterioration

Shared care plan for mental health

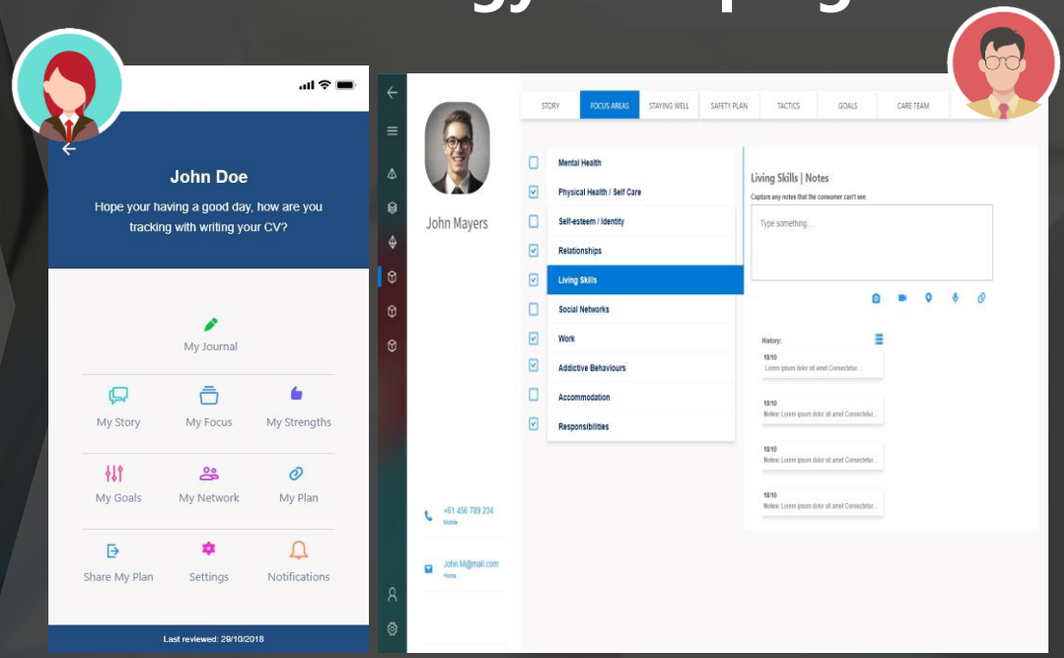
Business apps

Challenge

16 NFPs across MHDA

- Different care plans
- Repeated storytelling for consumer
- Limited consumer / patient generated data

How technology is helping



Murrumbidgee MHDA Recovery Plan consumer and carer apps

6 weeks agile development

Status – MVP complete March 2019. Pilot starting in Oct 2019

Emerging Tech

The last month in tech.....

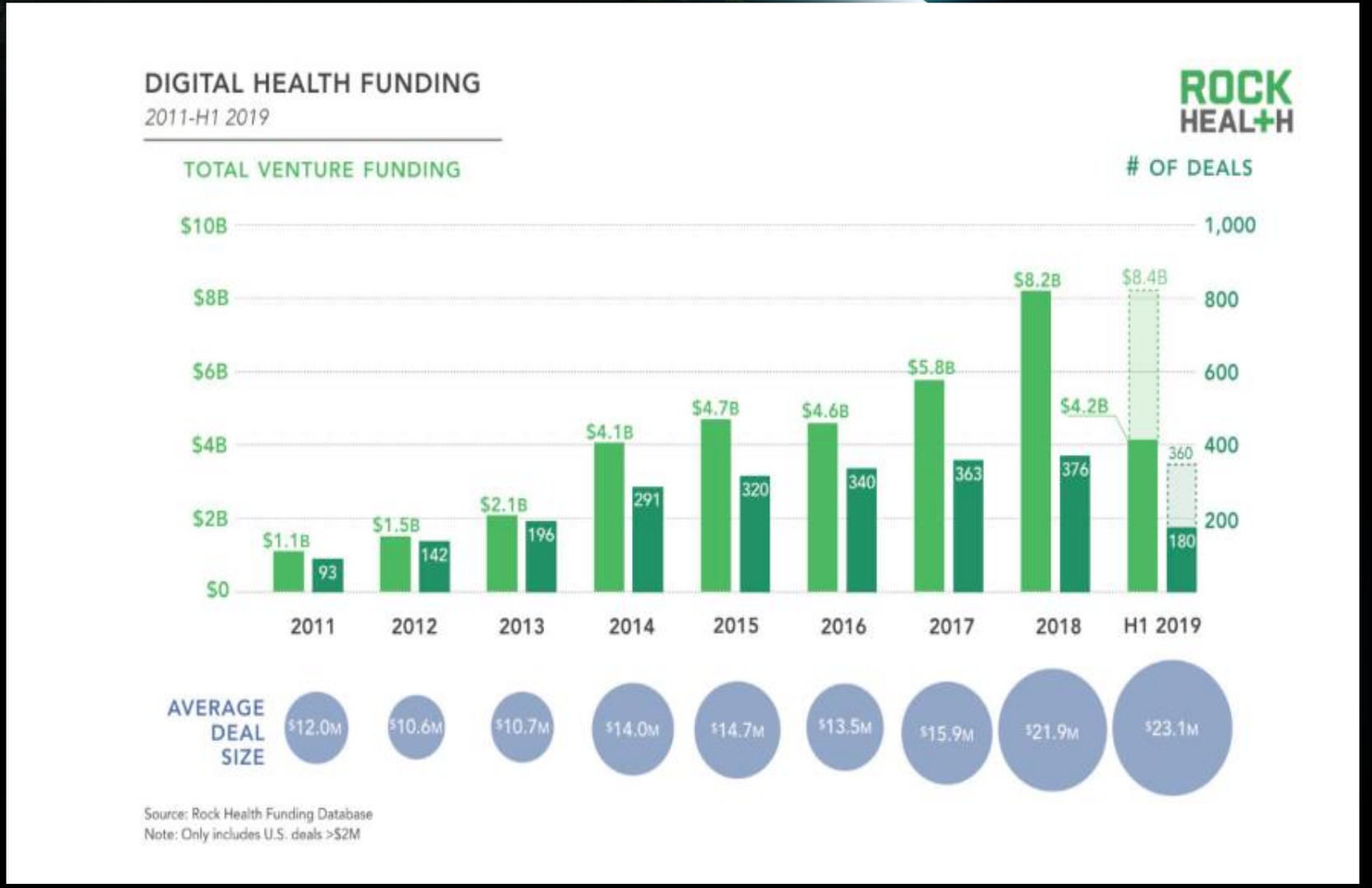
Digital Health Development

Key technology areas

IoMT
FHIR / SoF/ CDS Hooks
Low code / No code dev
Bots
AR / MR / VR
Data & analytics
AI / NLP

Key solution areas

Digital therapeutics
Genomics
Specialist areas (MH, WH)
Clinical trials
AI



Enter AI: *"An area of computer science that focuses on machines that learn"*

What to do when machines do everything. Malcolm Frank et al

Vision

2016

Object recognition human parity

Speech Recognition

2017

Speech recognition human parity

Reading

2018

Reading comprehension human parity

Translation

2018

Machine translation human parity

Speech Synthesis

2018

Speech synthesis near-human parity

Language Understanding

2019

General Language Understanding human parity

AI in Healthcare

Key focus areas

Clinical – Provider focused

Diagnostics – Imaging, Path, Wearables
Predictive analytics
Drug discovery
Clinical trials
Clinician assistants

Operational

Virtual assistants
Demand & capacity management
Workforce & resource management
Coding, billing, fraud detection

Clinical – Consumer focused

Diagnostics – Image, Wearables, Genomics, Microbiomics
Virtual & telehealth
Mental health
Women's health
Wellness management

Market confidence

$2.65B USD invested in last 12 months (precision medicine, drug discovery, pathology)

Rapid rise of health AI patents in last 24 months (esp. GE, Siemens, Philips)

Significant partnerships, centers of excellence, e.g.
NHSX - £250M
Microsoft AstraZeneca – AI Factory

Increasing Australian startup / new entrant ecosystem (e.g. HarrisonAI, Maxwell Plus)

Regulation and evidence

Regulation

Around 20 FDA regulatory clearances for AI based CDS tools e.g.

- Viz.AI – triage of stroke CT
- IDx-DR – diabetic retinopathy
- Imagen Osteo Detect- forearm #
- AliveCor KardiaMobile – AF, 6-lead

Research

Meta-analysis - comparison of deep learning performance vs healthcare providers on medical imaging

- 14 of 31,857 studies
- Equal performance ('doc vs machine")

1. Lancet Digital Health 2019; 1: e271–97
Published Online September 24, 2019
https://doi.org/10.1016/S2589-7500(19)30123-2

Changing Interfaces to Support Care

Medical Procedure Support

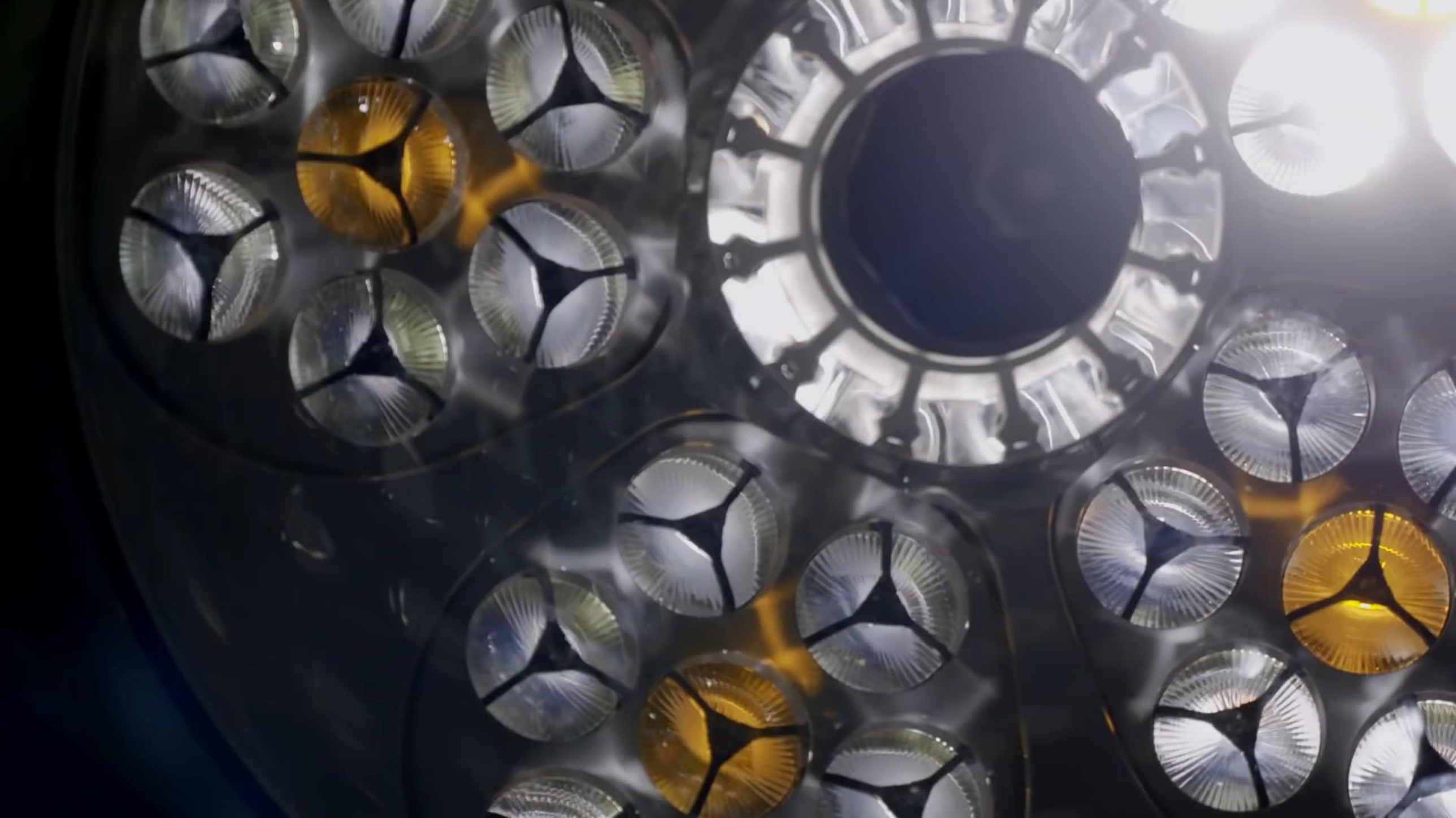
Novarad, USA

OpenSight Platform for procedure guidance (FDA 510k cleared)

Falls risk prevention

Ocuvera, USA

Computer image alerting for falls risk with Azure Kinect DK



Engaging with Tech

Engaging with Tech companies

Strategy, planning, governance

Network connections

Partner connections

E.g. Responsible AI (AETHER)

Development collaborations / partnerships

HCD / Ideation workshops

Hackathons

PoC's

Skills & Training

E.g. Azure discover days, Microsoft Technology Center

Start ups & Incubators

E.g. ScaleUp

Program funding

E.g. AI for Accessibility

“The way here is not to think technology versus human, but to ask how they come together where the sum can be greater than the parts for an equitable, inclusive, human and humane care and practice in medicine.”

Dr. Abraham Verghese, professor at Stanford University School of Medicine

If not us, then who? If not now, then when?

Based on Hillel, first- century Jewish scholar

Thank you

Microsoft