



Digital Healthcare and AI

Trends in Medical Device, AI, Cloud and Datacenter Infrastructure

Mike Kemelmakher, May 2021

About



Mike Kemelmakher

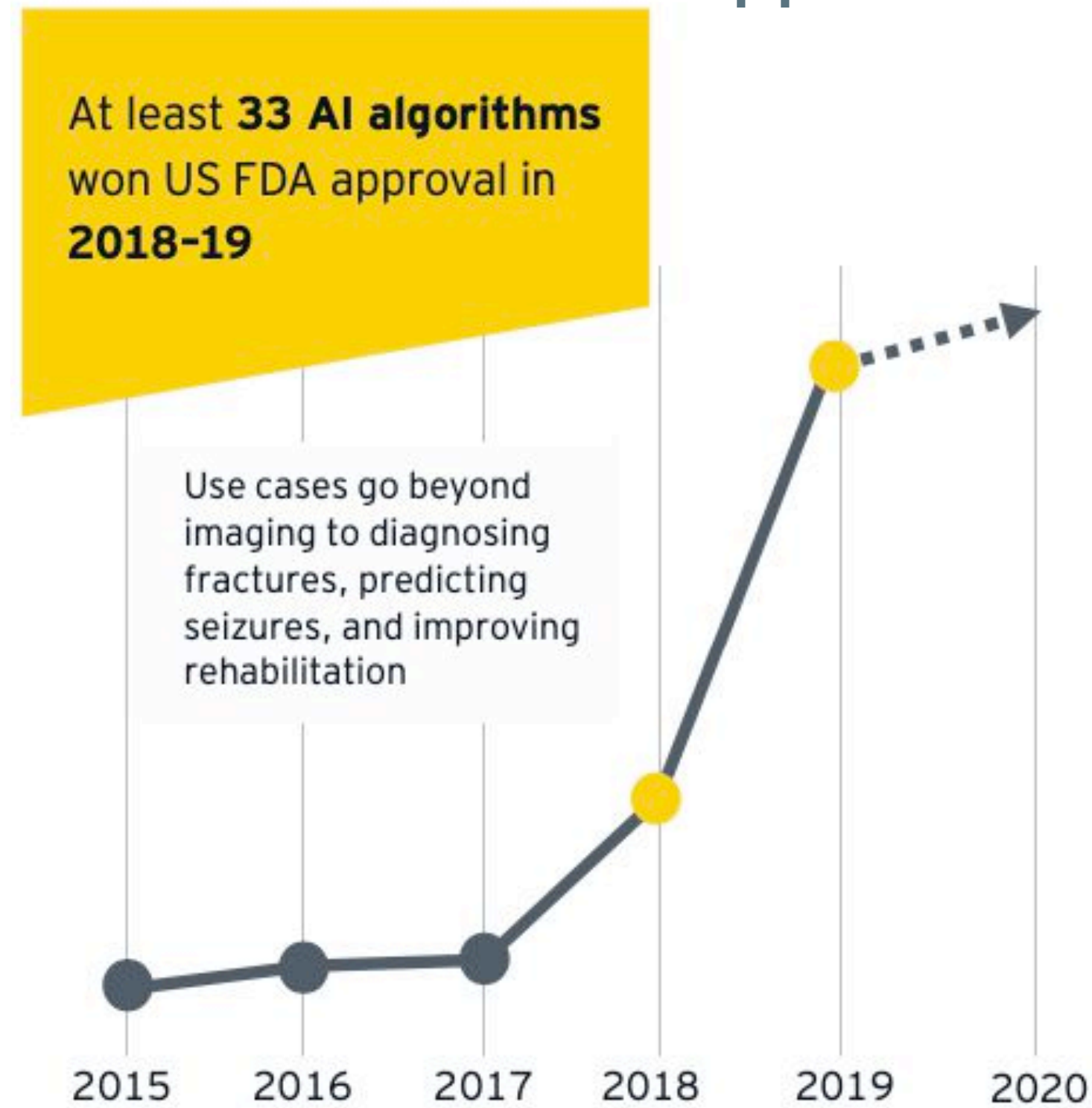
Technology Executive, Entrepreneur

Cofounder of medical technology startup ArgosMD. Advisor to startups and enterprise companies in the areas of AI, HW Accelerators and Cloud Infrastructure. ex-Vice President of Innovation and Global Head of Computer Vision at SAP. At SAP Mike architected global AI and ML strategy for SAP CTO office and SAP executive board, and managed multiple R&D organizations with multi \$M budget. Prior to his tenure in SAP, Mike founded private software consulting practice in Israel focusing on defense, cyber security and telecom sectors. Mike holds BsC and MsC in Computer Science, and participated in Computer Science research PhD program in Bar Ilan University in Israel.



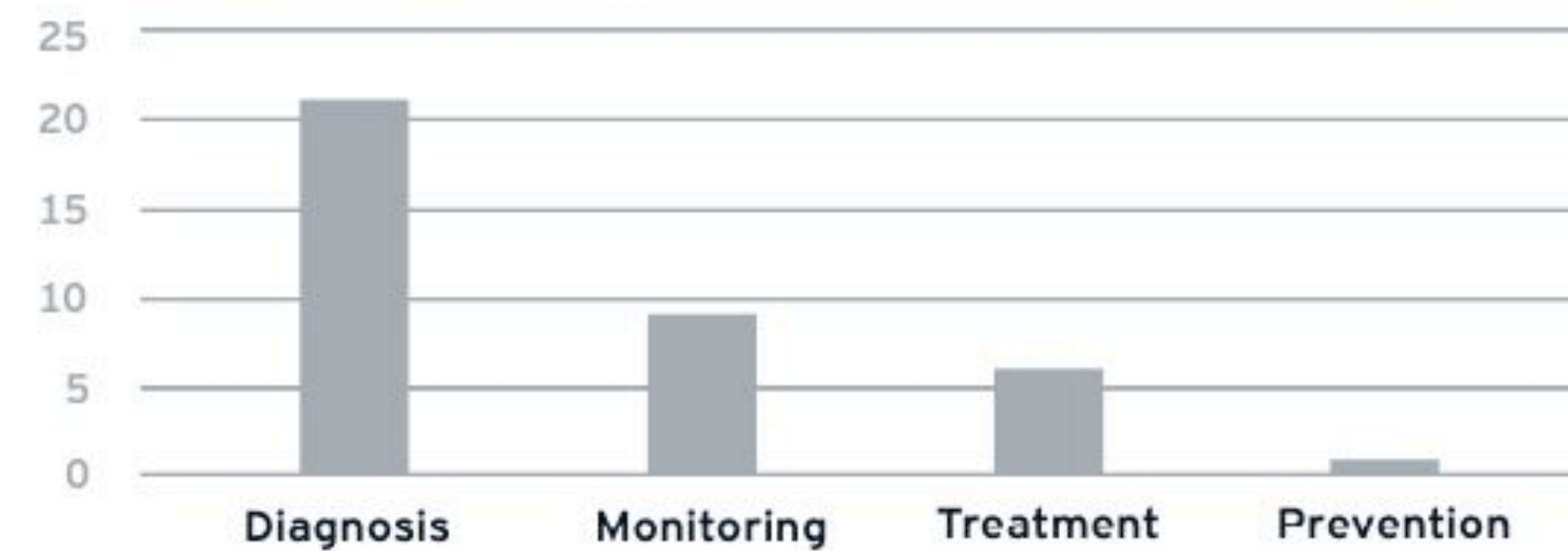
AI IS A TOP AREA OF INNOVATION IN MED-TECH SECTOR

AI remains a top area of innovation, with at least 33 algorithms winning US regulatory approval since the beginning of 2018

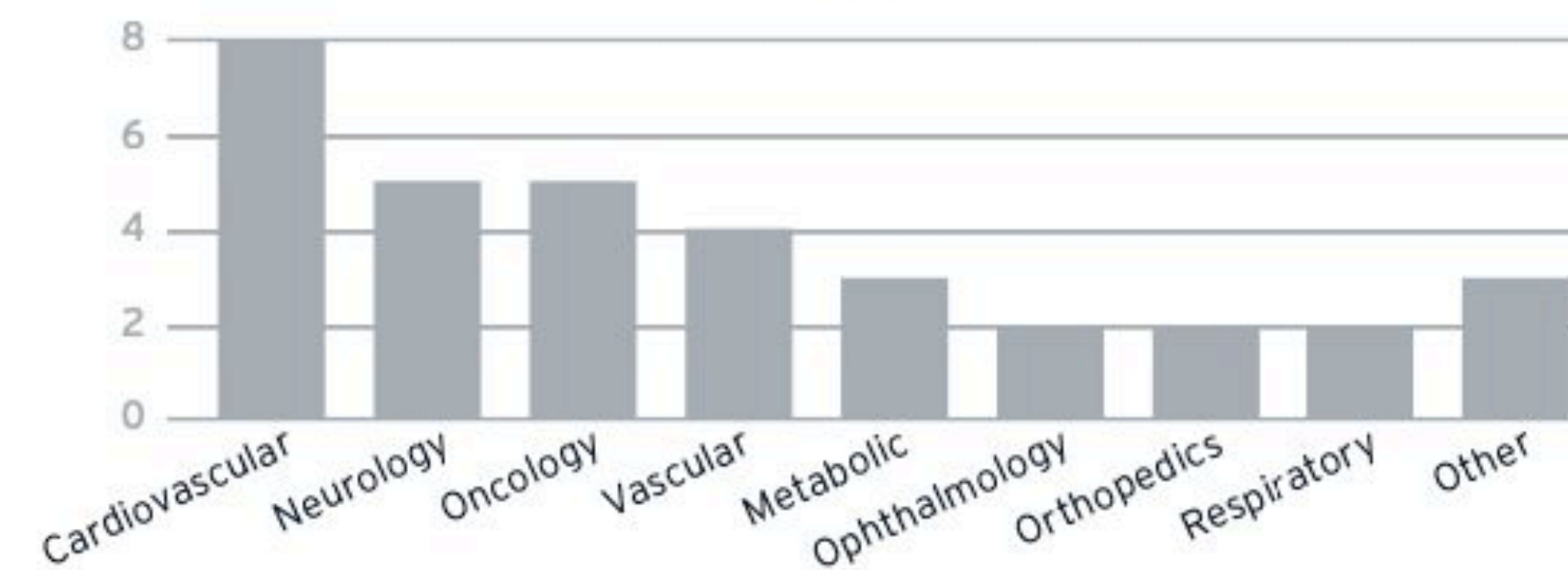


Source: EY, US Food & Drug Administration.
 Number of approvals may exceed 33 because some approvals may be mapped to multiple use cases or therapy areas.

A majority of 2018-19 approvals diagnose or monitor disease ...



... in cardiovascular and neurology therapy areas



AI is not only making these instruments smarter, faster and more reliable, but it is also making them more portable and mobile

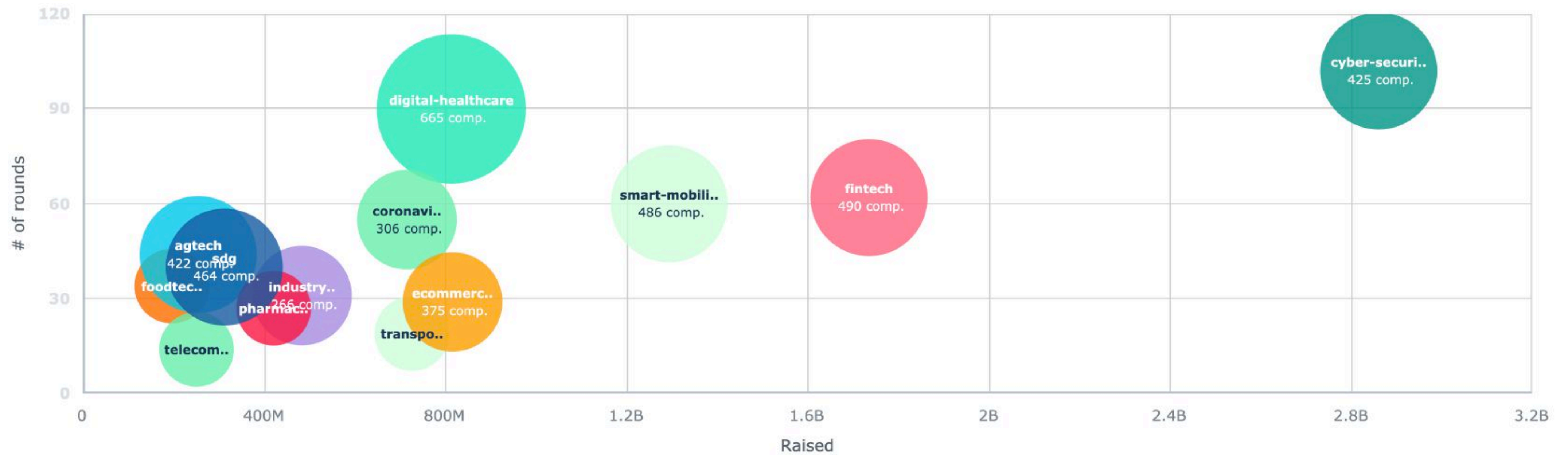
"As data personalizes medtech, how will you serve tomorrow's consumer?"
 Pulse of the industry 2019" Ernst & Young (EY) Life Sciences. 2019.

TREND: INVESTMENTS IN DIGITAL HEALTHCARE IN ISRAEL 2020

TRENDING INVESTMENTS

2020 **Year** Q1 Q2 Q3 Q4

[Tags Glossary >](#)

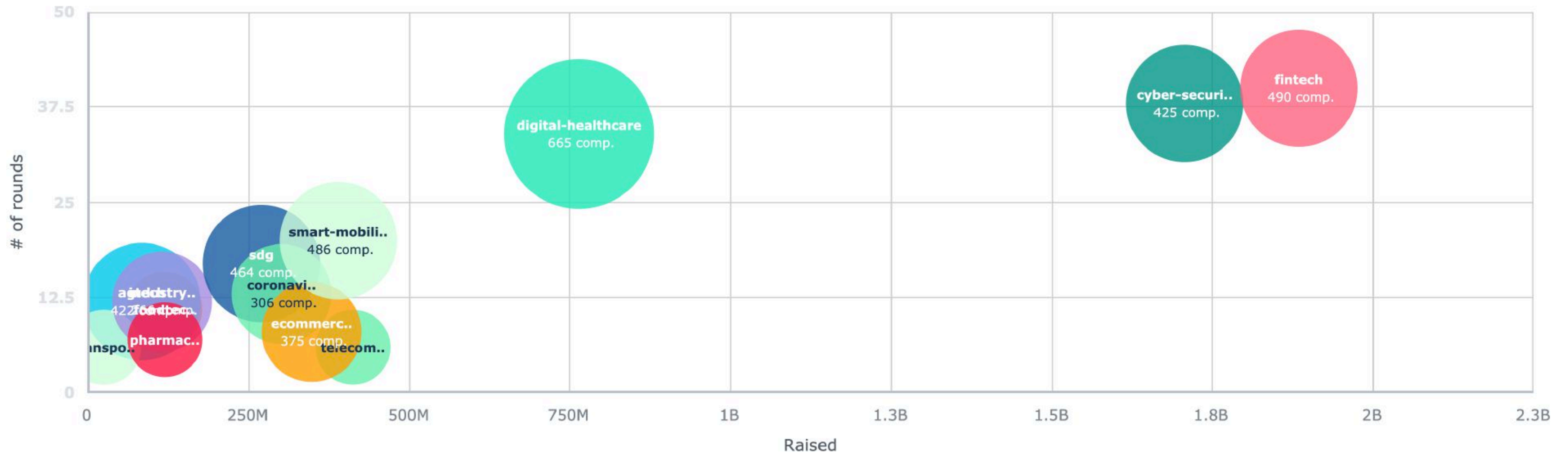


TREND: INVESTMENTS IN DIGITAL HEALTHCARE IN ISRAEL 2021

TRENDING INVESTMENTS

2021 ▾ **Year** Q1 Q2 Q3 Q4

[Tags Glossary >](#)

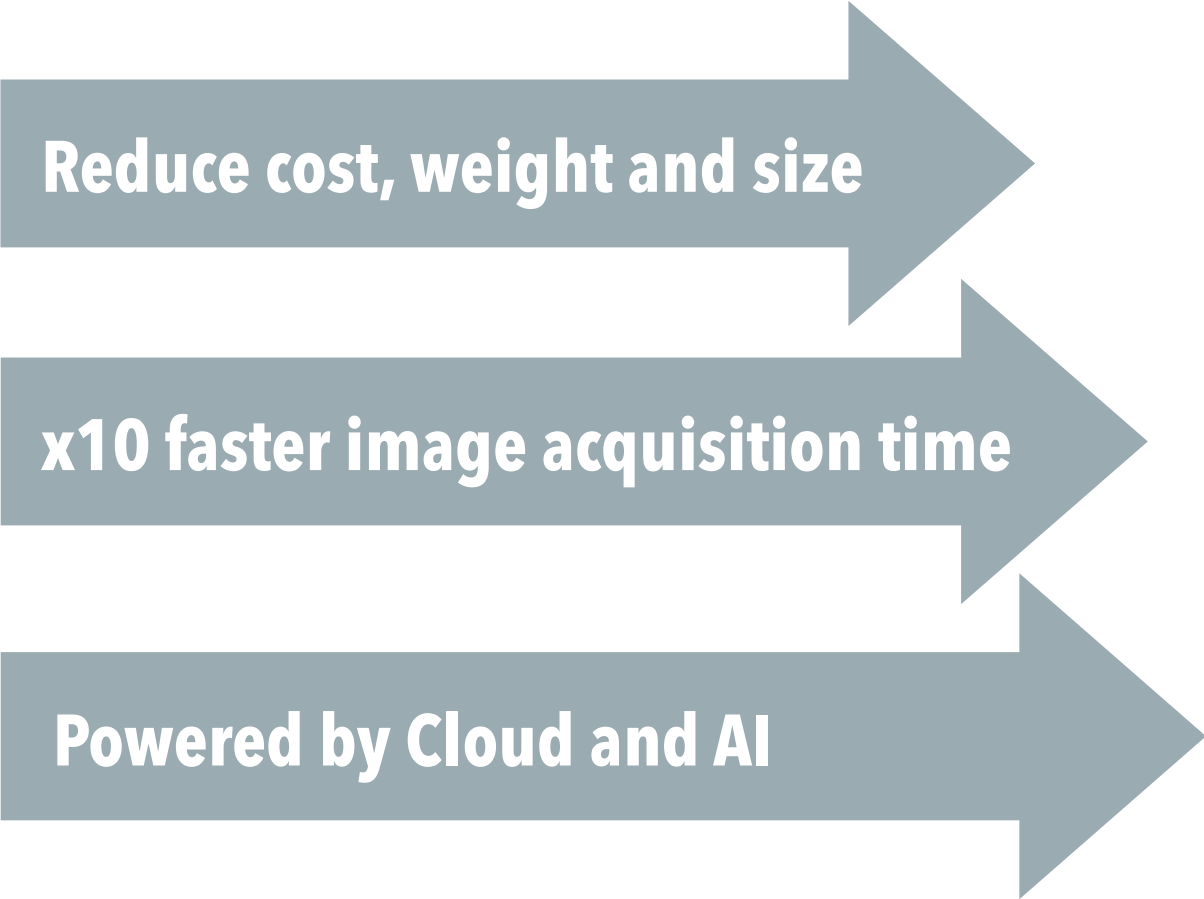


TREND: MINIATURIZATION AND DIAGNOSIS AS A SERVICE

Present commercial medical imaging devices
Price: >\$150K + annual service fee



Capital Equipment
Manual Diagnosis



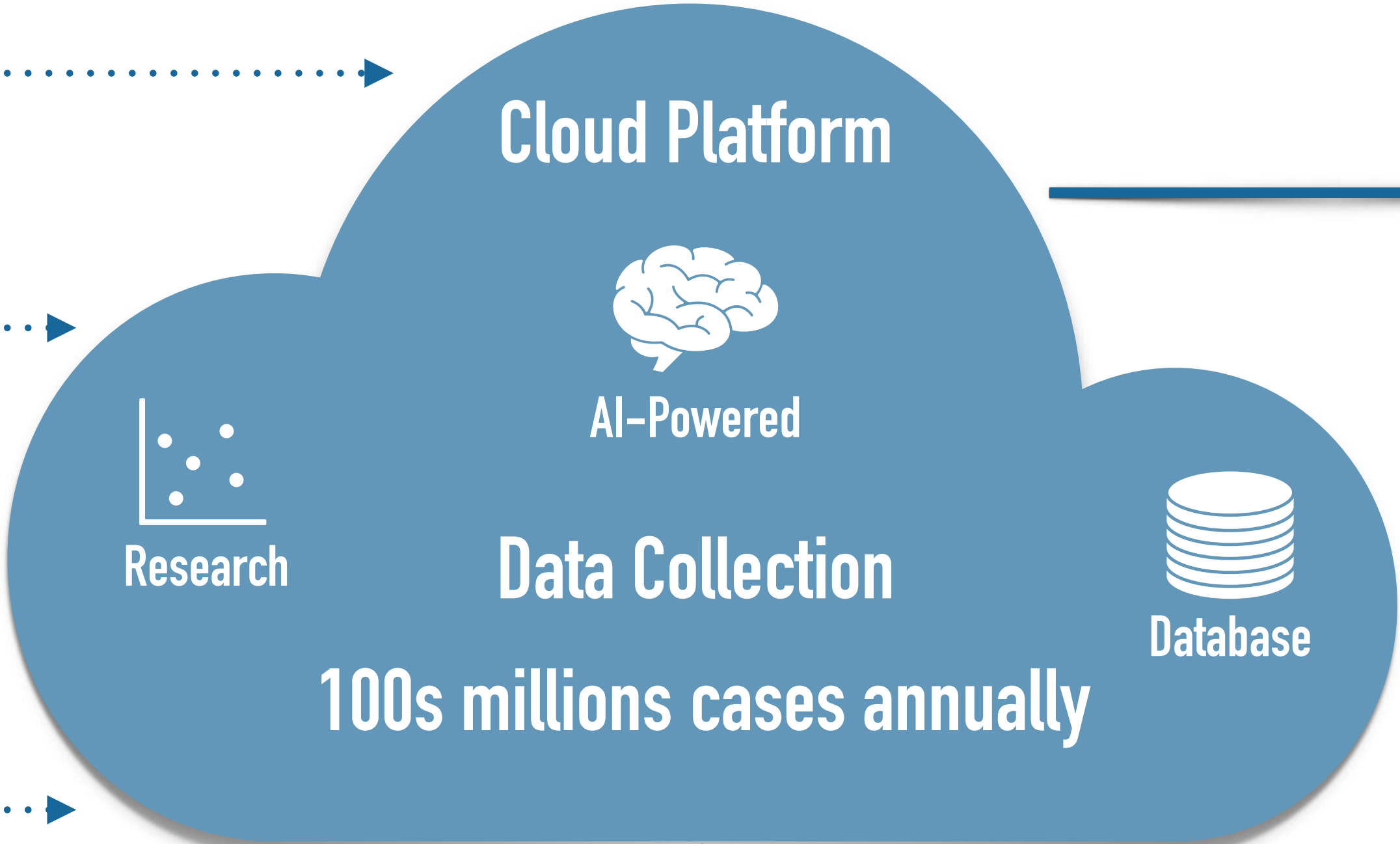
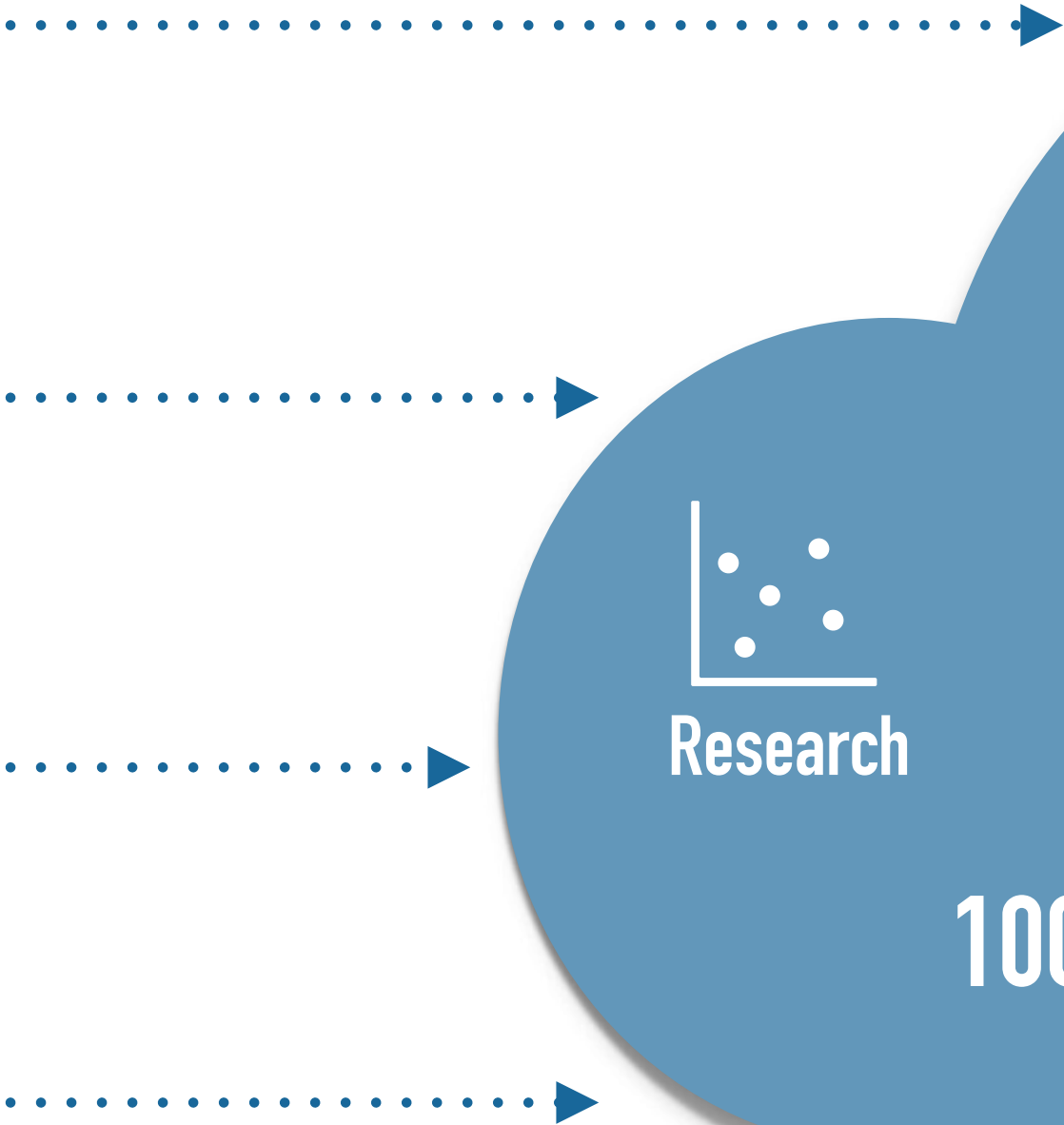
Full Stack Diagnostics Service
Price: < \$10K + service subscription



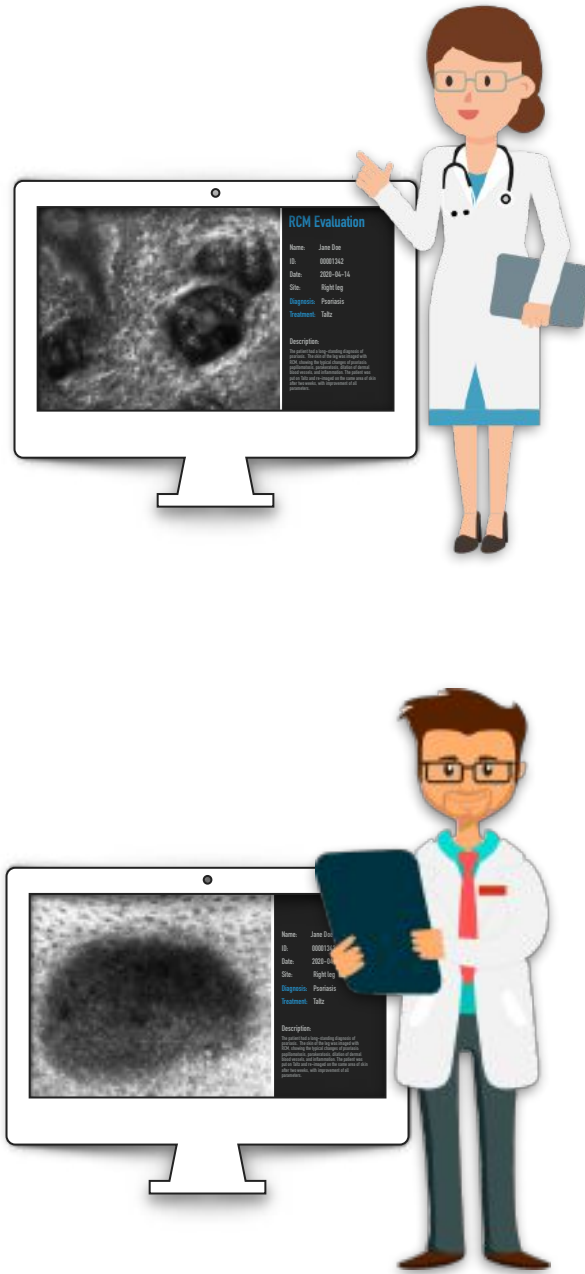
Low Cost
AI aided diagnosis

MEDICAL DATA COLLECTION AT SCALE

Digital Data Capture



Digital Pathology and Radiology



AI-Aided Diagnosis

▶ **Rapid diagnostics**

A white-bordered box containing a grid icon, the title "AI-Aided Diagnosis", three microscopic images (one large, two smaller), and the text "▶ Rapid diagnostics".

DIGITAL OPTICAL BIOPSY AT POINT-OF-CARE

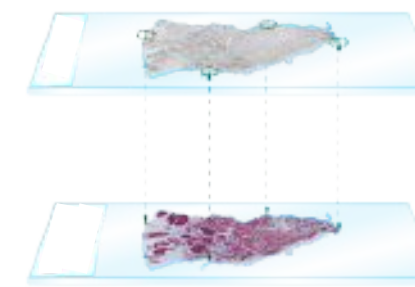
Visual Inspection



Painful Biopsy



Manual Tissue Processing



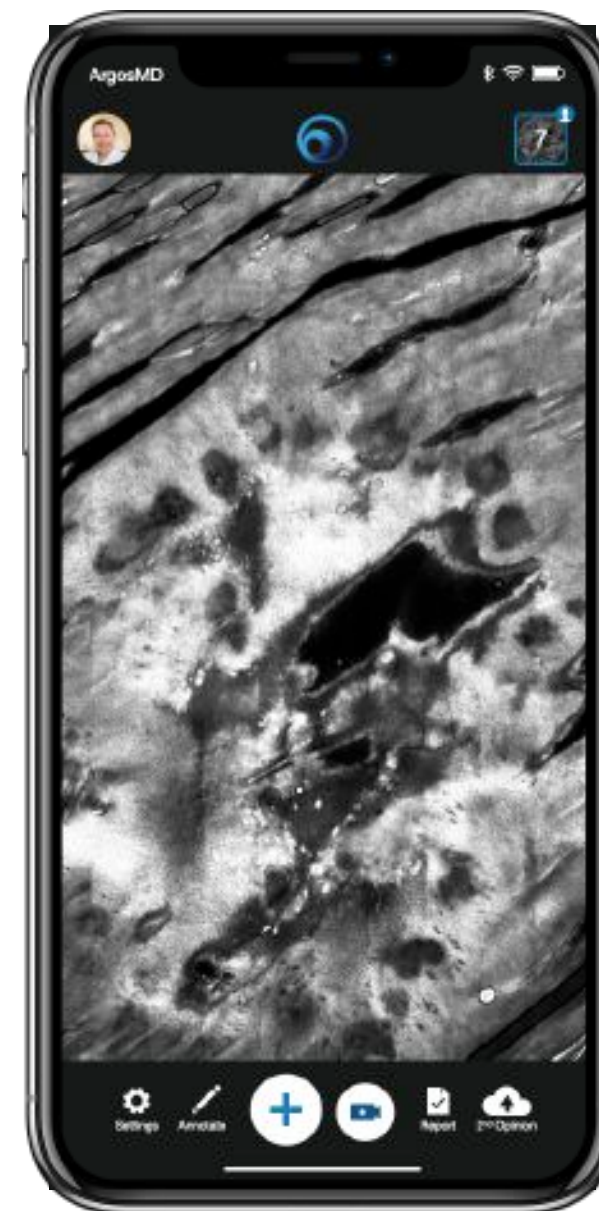
Manual Pathology



Analog Slide Storage



Digital Tissue Imaging



Instant AI Aided Diagnosis

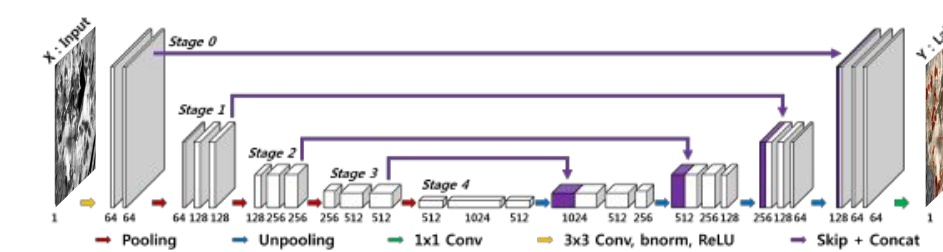
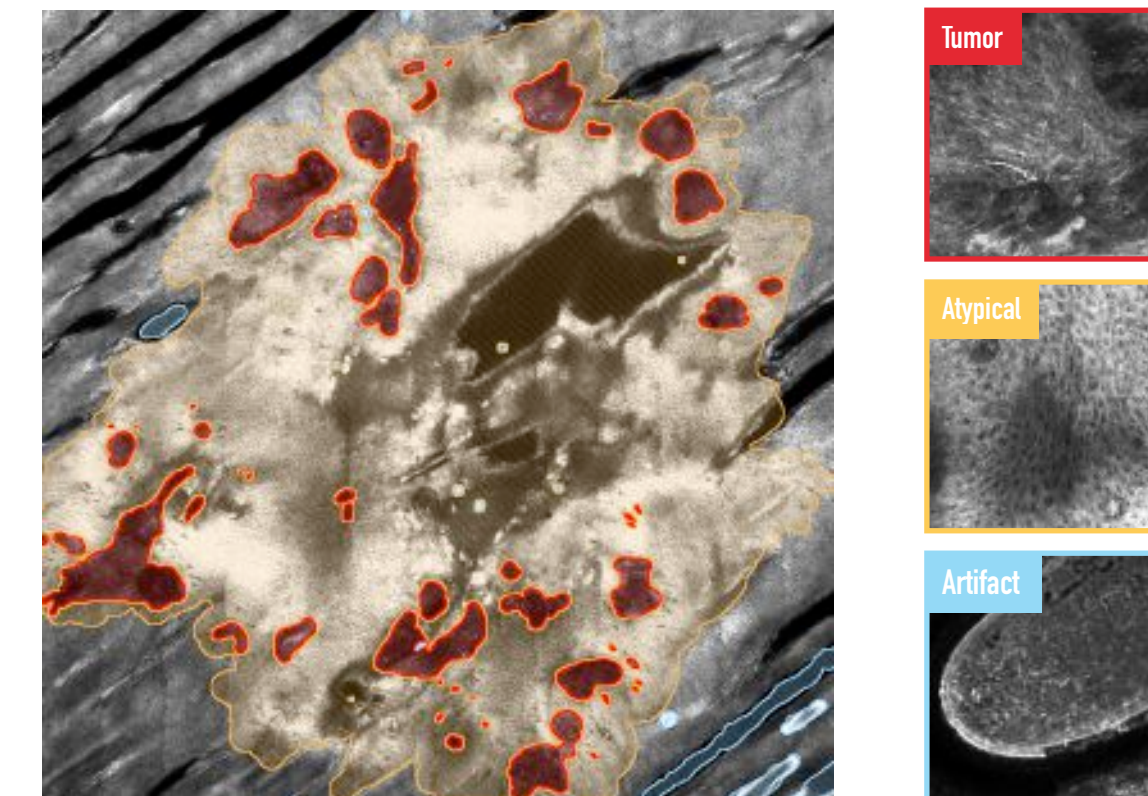
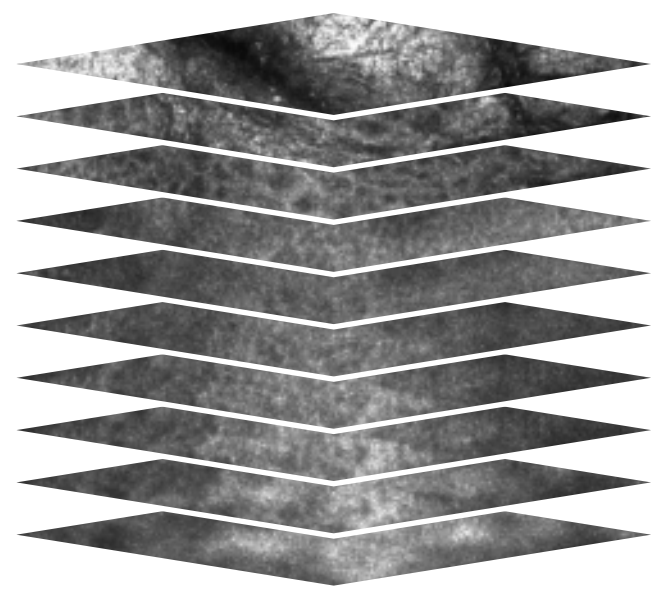


Image Data Segmented and Classified by AI

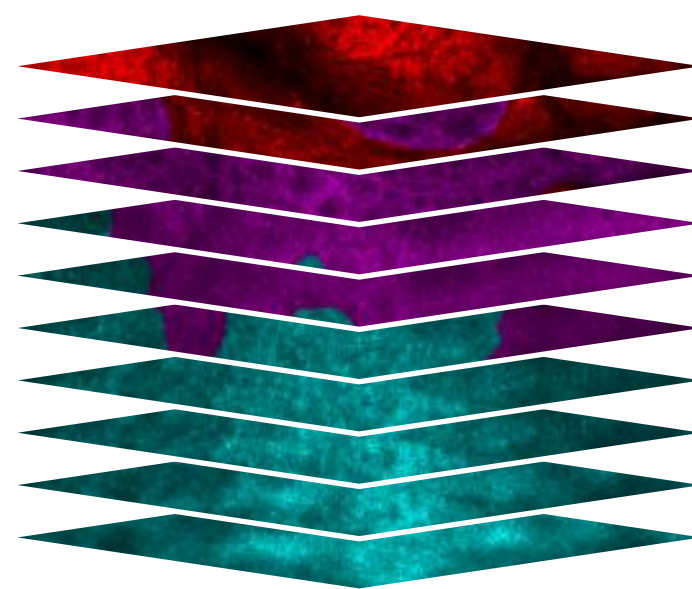
3D PATHOLOGY, AI BIOMARKERS AND TREATMENT RECOMMENDATIONS



Raw Data Volume

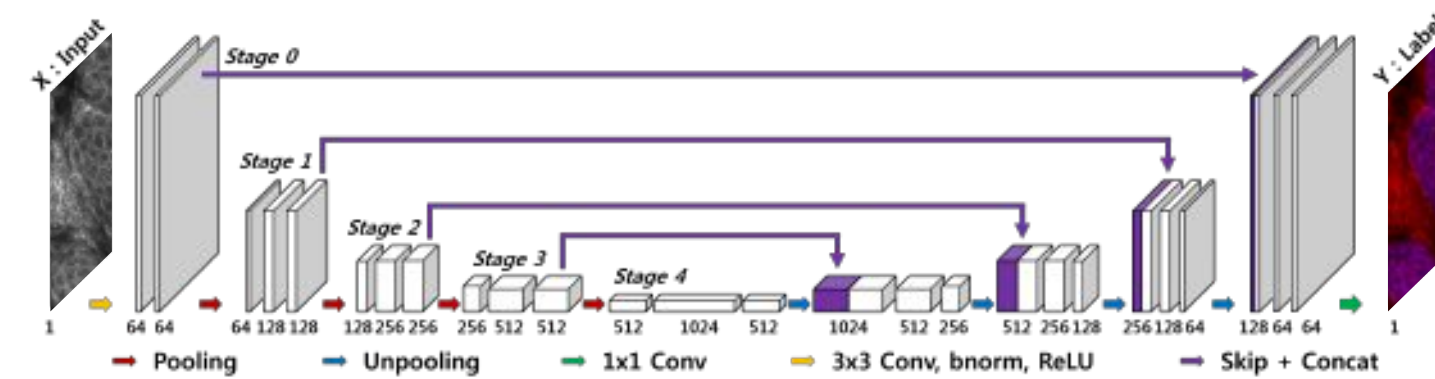
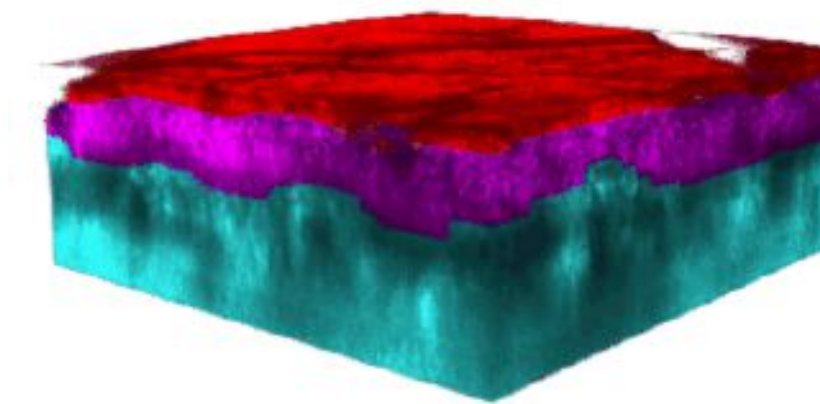


Labeled Data

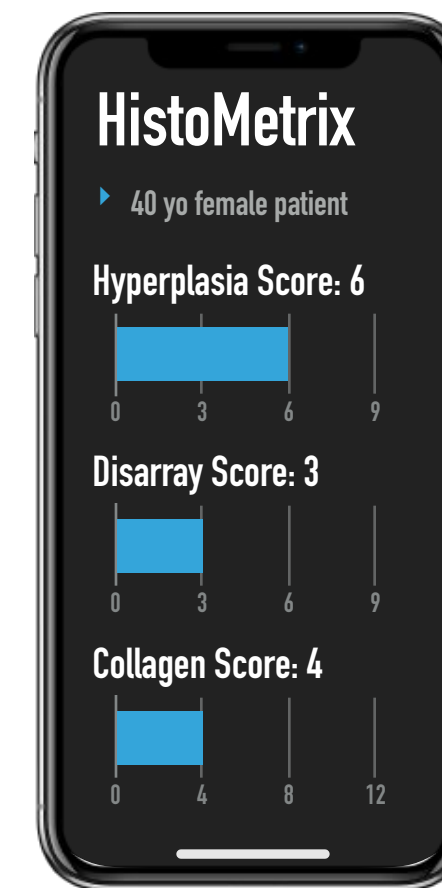


3D Visualization
Biomarker Metrics

Diagnosis, Anti Aging and Skin Health



Automatic AI Processing and Biomarker Calculation



Product Recommendations

INTELLIGENT MEDICAL DEVICES - AI INFRASTRUCTURE

Digital histology slide scanner



Digital Proteomics



Portable Ultrasound with AI



Portable MRI



Portable Digital X-Ray



Common Architecture on Public Clouds



HIPAA, SOC2, GDPR Certified PaaS

- Scalable Access to HW accelerators GPU, TPU, FPGA
- Pre-trained ML/AI APIs
- ML/AI Model Repository
- Data Sets Repository
- Data Protection
- Specialized Medical Data Storage - PACS
- AI/ML Models Training Infrastructure and Tools

INTELLIGENT MEDICAL DEVICES - AI INFRASTRUCTURE

Digital histology slide scanner



Digital Proteomics



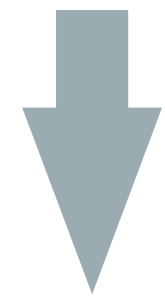
Portable Ultrasound



Portable MRI



Portable Digital X-Ray



EDGE AI Platforms



Data Acquisition Post-Processing and AI Inference

DATA



AI MODELS



Cloud/ Data Center Platforms



AI Models Training and Serving at Scale - Multi GPU, NVME, 200GbE



GRAPHCORE





Спасибо За Внимание!

Q&A