DIGITAL OPEN WEEK

UNIPD EXECUTIVE LEARNING

MDHC

Master Digital Health Care

II LIVELLO

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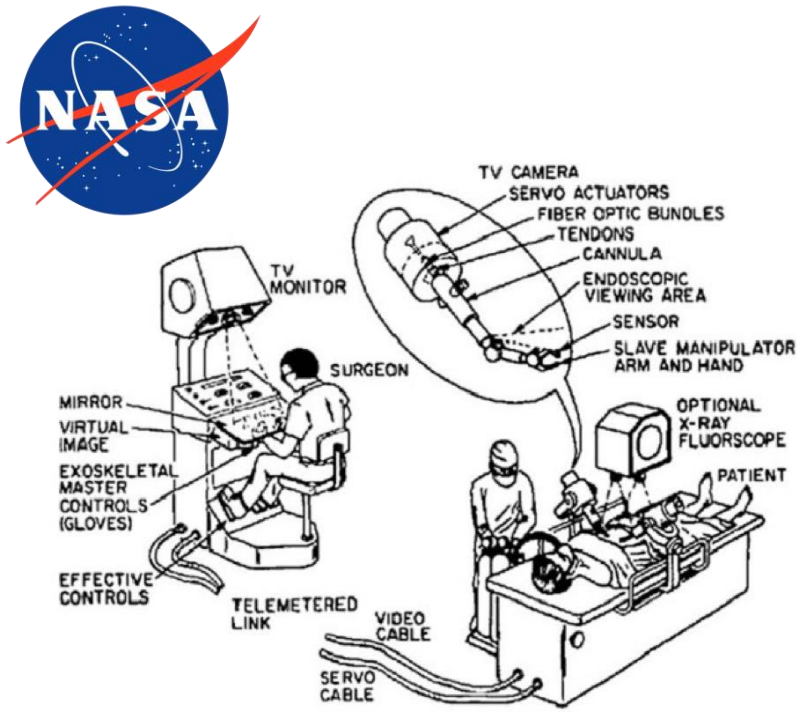
Vice Direttore: Valerio Vergadoro

Anno accademico 2022/2023

Sanità Digitale ?!

Ovvero… c'è bisogno di un Master?

Prof. M. Valmasoni, MD PhD FACS

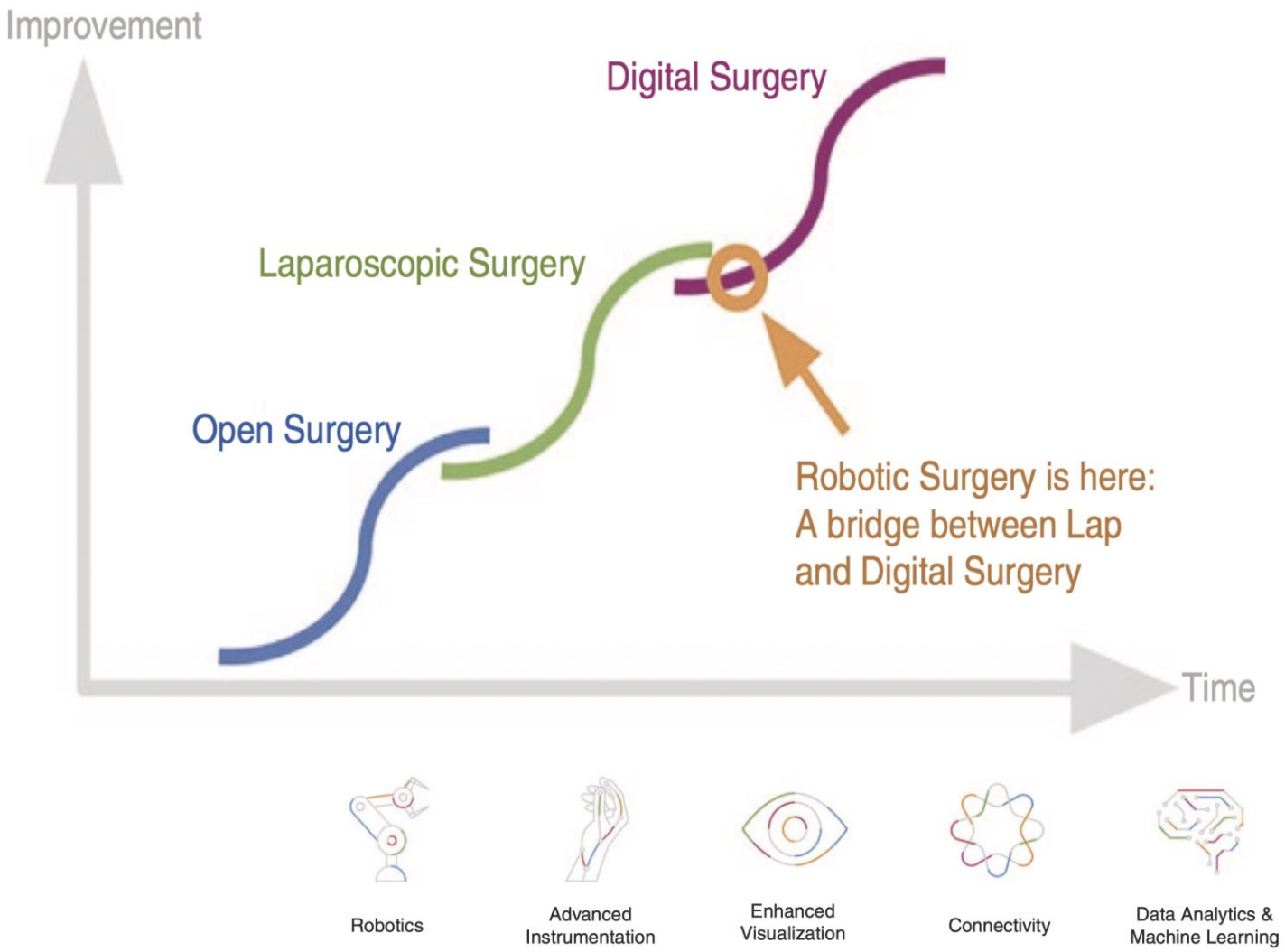


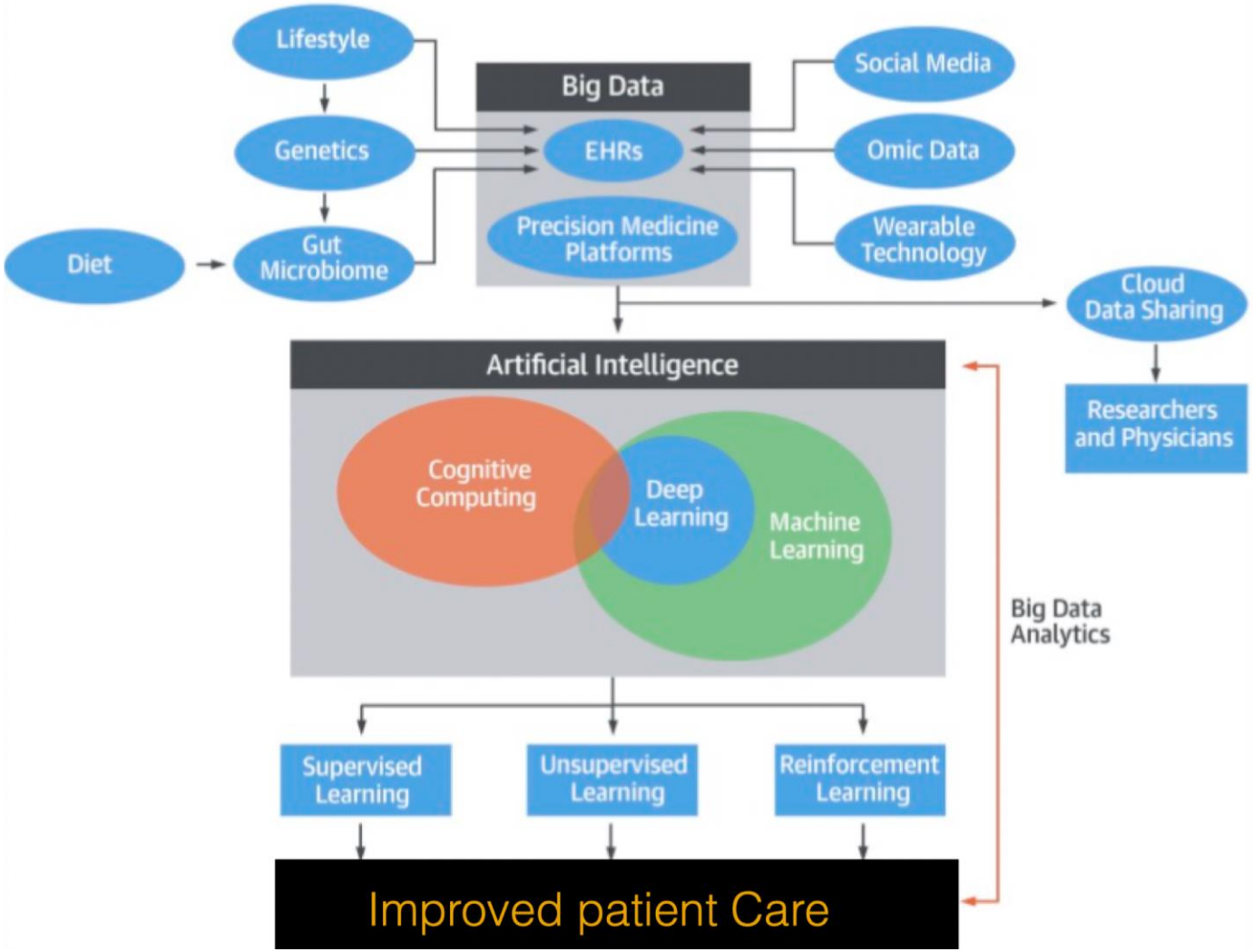
1971

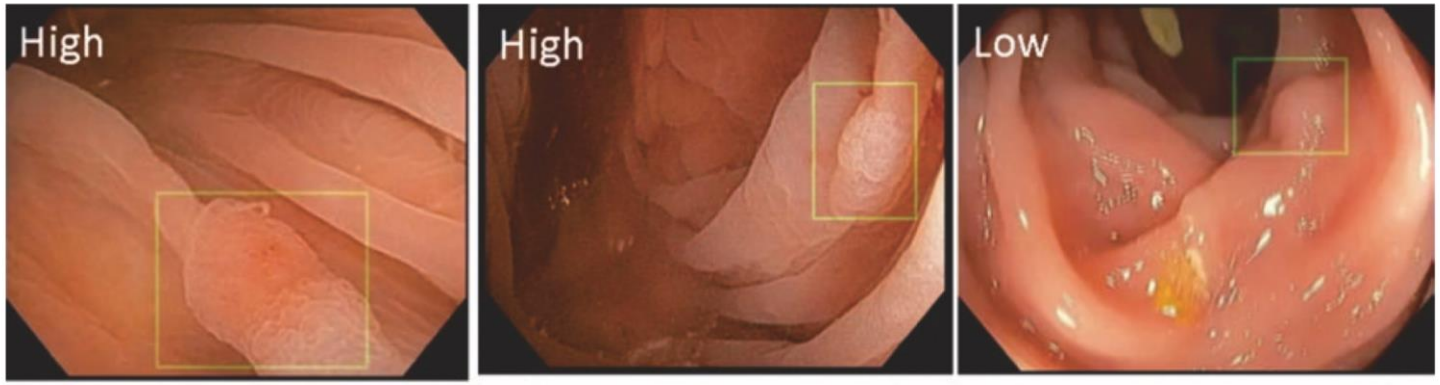
1985

1990

Oggi

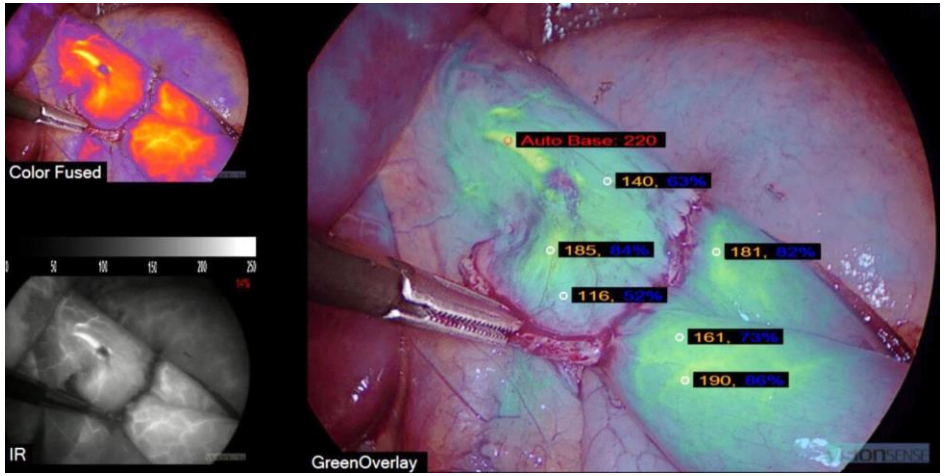

Improvement
Digital Surgery
Laparoscopic Surgery
Open Surgery
Robotic Surgery is here:
A bridge between Lap
and Digital Surgery
Time
Robotics
Advanced
Instrumentation
Enhanced
Visualization
Connectivity
Data Analytics &
Machine Learning


Lifestyle
Genetics
Diet
Gut Microbiome
Big Data
EHRs
Precision Medicine Platforms
Social Media
Omic Data
Wearable Technology
Cloud Data Sharing
Researchers and Physicians
Artificial Intelligence
Cognitive Computing
Deep Learning
Machine Learning
Big Data Analytics
Supervised Learning
Unsupervised Learning
Reinforcement Learning
Improved patient Care

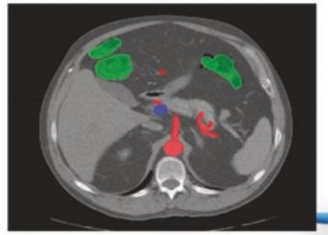


Removed polyp

Additional polyps found on CNN-overlaid videos



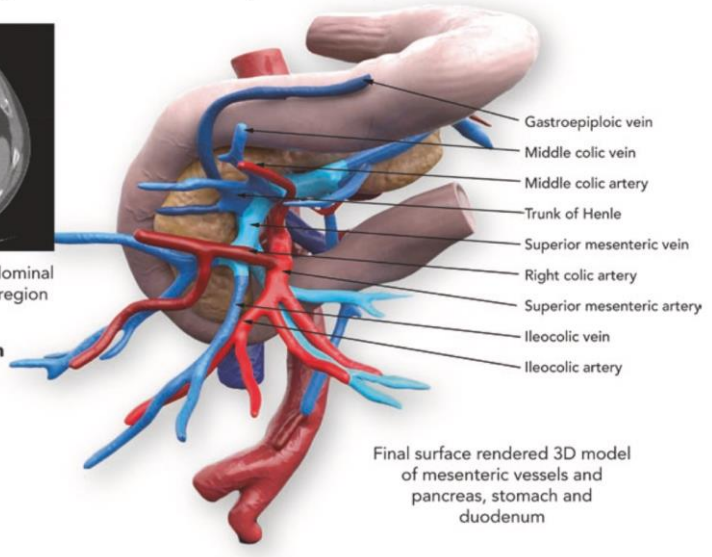
From segmentation to 3D patient specific model



Segmented portovenous CT abdominal imaging using semi-automated region growing approach

Available segmentation software

3D Slicer
ITK SNAP
Synapse Vincent
Seg 3D
Image J
Osirix X
Materilise mimics



Final surface rendered 3D model of mesenteric vessels and pancreas, stomach and duodenum

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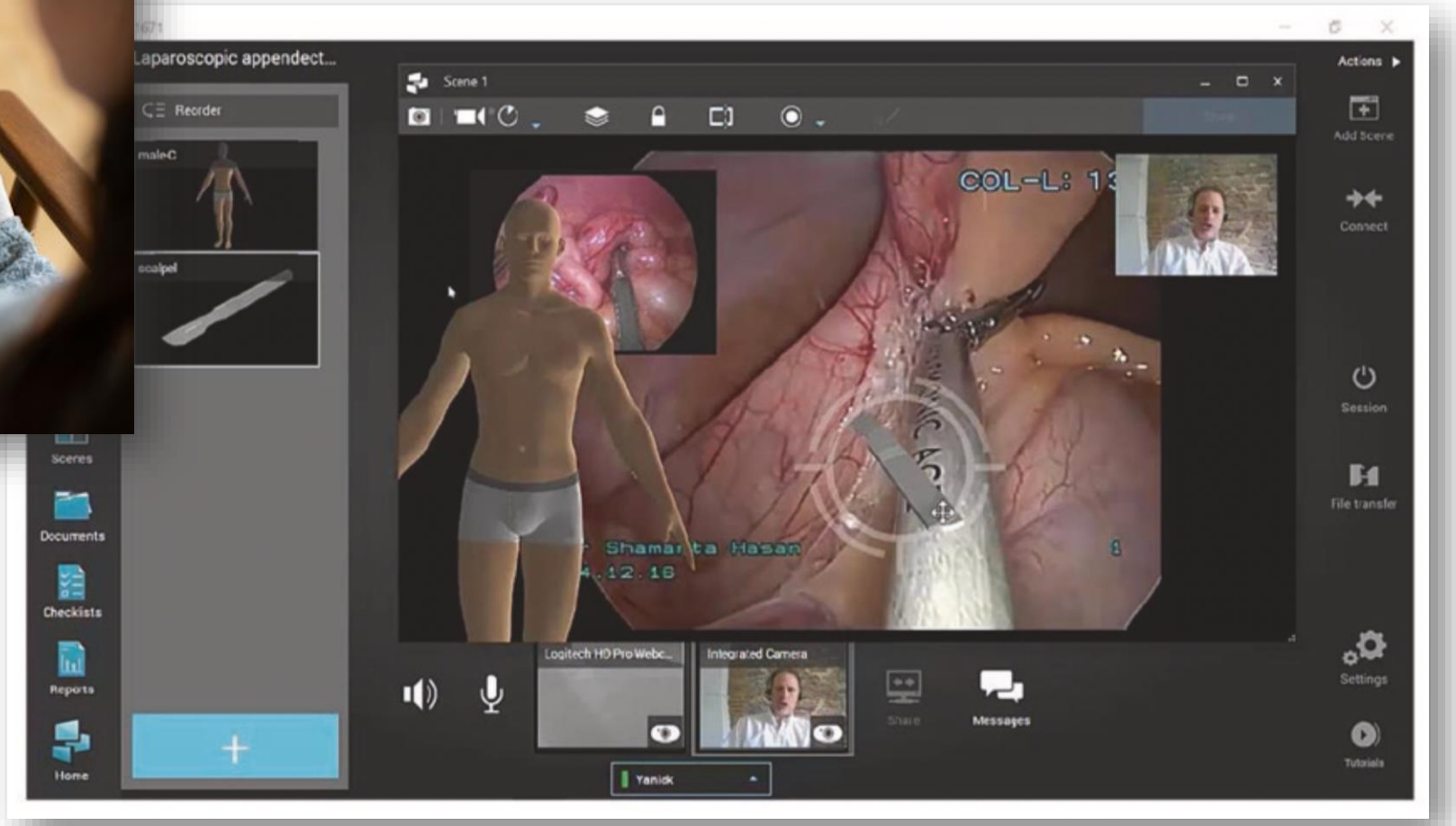
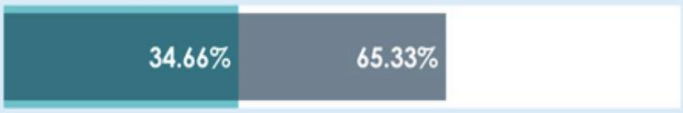


IN THE NEXT 5 YEARS

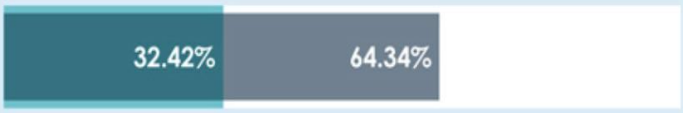
Portable medical devices for professionals
Portable diagnosis and treatment devices for medical professionals

Health sensors for consumers
Wearable devices, digital tattoos, smart clothes for monitoring health unobtrusively

IoT in healthcare
Internet of things in healthcare devices

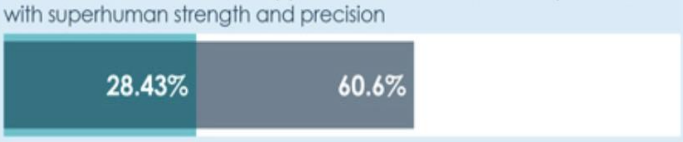


3D printing
3D printed tissues, skin, blood vessels, bones

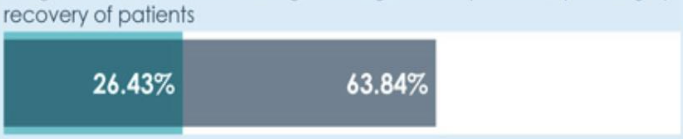


Genomic analysis
Receiving treatment customised to our molecular makeup and genetic background

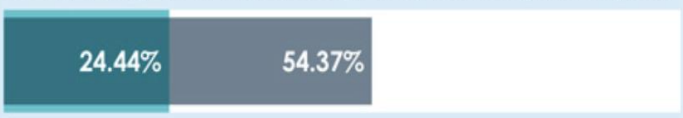
Robotics
Robotic nurse assistants to support the work of healthcare professionals with superhuman strength and precision



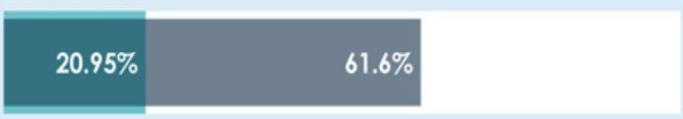
Virtual reality in healthcare
Usage of VR in medical training, relaxing chronic patients, speeding up recovery of patients



AI in medical decision support
The expanding role of artificial intelligence in monitoring and diagnosis



Augmented reality (AR)
Projecting digital data onto real-life imagery, used for diagnosis and health education



IN THE NEXT 25 YEARS

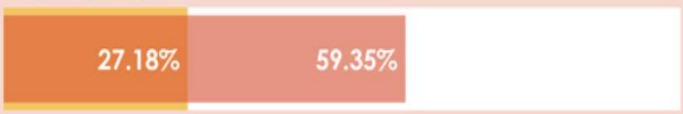
Tele-Medicine
Lack of doctor shortages will be solved via tele-medicine, via Ubers of healthcare to bring the attention and expertise of doctors to the masses

Hospital redesign
Revolutionary changes in traditional "general hospitals"- hospitals becoming smaller, as more healthcare (diagnosis and treatment) will be done at home

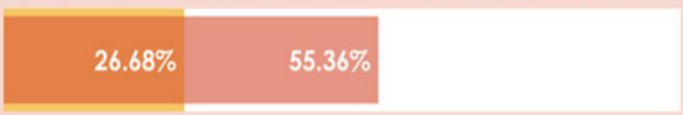
Precision medicine
Using big data and AI to identify medical approaches for patients based on genetic, environmental and lifestyle factors

Devices inside the body (nanotechnology)
Nanometer-sized robots in our body will cure and monitor health

Man-made organs
3D printing of organs



Ageing research
Ageing will become a treatable disease – people will cease to age



Designer babies
Manipulate DNAs to customise babies

Brain-Computer Interface (BCI technology)
Our brains will be directly connected to AI

The Economist

promising future, but barriers remain

The future looks promising for AI-based automation ...

- New job creation
- Opportunity to build advanced AI capabilities
- Emergence of general AI to create a synthetic system as sophisticated as the human
- Formulation of an AI regulatory framework

... but barriers that restrict its universal acceptance remain

- Absence of interoperability
- Regulatory implications
- Moral/ethical implications
- Concerns about data privacy
- Shortage of relevant and sufficient talent

MDHC @ UNIPD

Formazione viva.

The best way to predict your future is to create it.

A. Lincoln

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