



Mr. Bert Hoorne
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Az Groeninge: Applied AI in healthcare



Applied A.I. in Healthcare

Medical Imaging AI
to Empower Clinicians

September 11th, 2019

Bert Hoorne
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Western Europe



Center Oncology/Radiotherapy



Total Surface Area: **117.422 m²**

Number of medical doctors: **197**

Total recognized beds: **1054**



LIEFHOOGHE NICK

Radiation Therapy?



Why?

To cure cancer
To reduce symptoms

How?

Damaging the DNA within cancer cells, destroying their ability to reproduce

Linear Accelerator: TrueBeam (Varian)

TrueBeam

TrueBeam STx



Radiotherapy
- 120 leaf MLC



Radiotherapy & **Radiosurgery**
- 120 leaf **High Definition** MLC

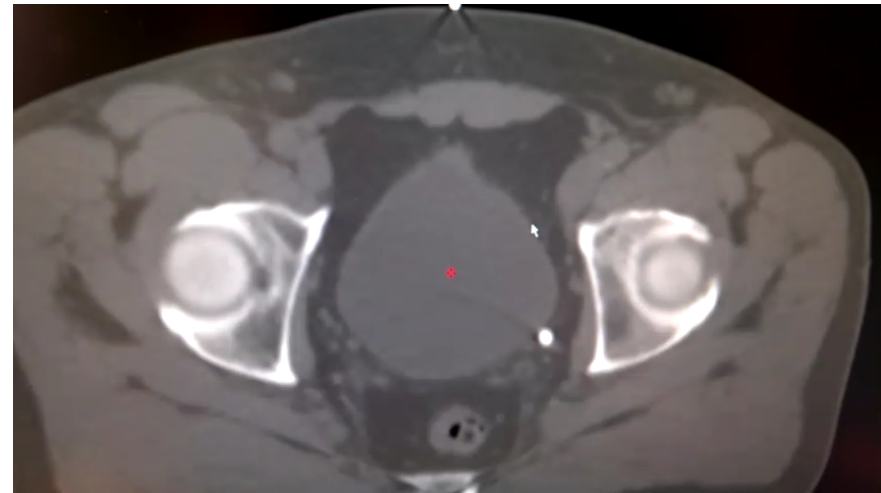
Assistive AI for radiotherapy planning



Problem: Delineating tumors and anatomy in images by hand is costly and inaccurate

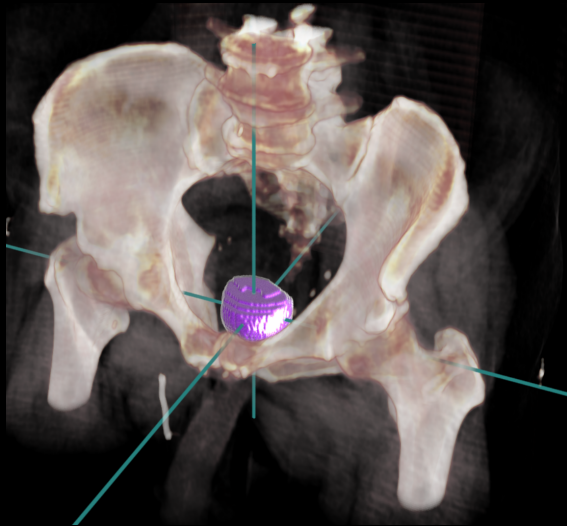


A linear accelerator (linac) for radiotherapy delivery



Tracing anatomy in a popular commercial tool

The InnerEye position



InnerEye is a **research project** that develops machine learning cloud services to

assist medical experts

in tasks of **measurement, delineation** and **quantitative temporal assessment**



“What used to take hours can now be done in minutes”

Dr. R. Jena, Radiation Oncologist, University of Cambridge Hospitals

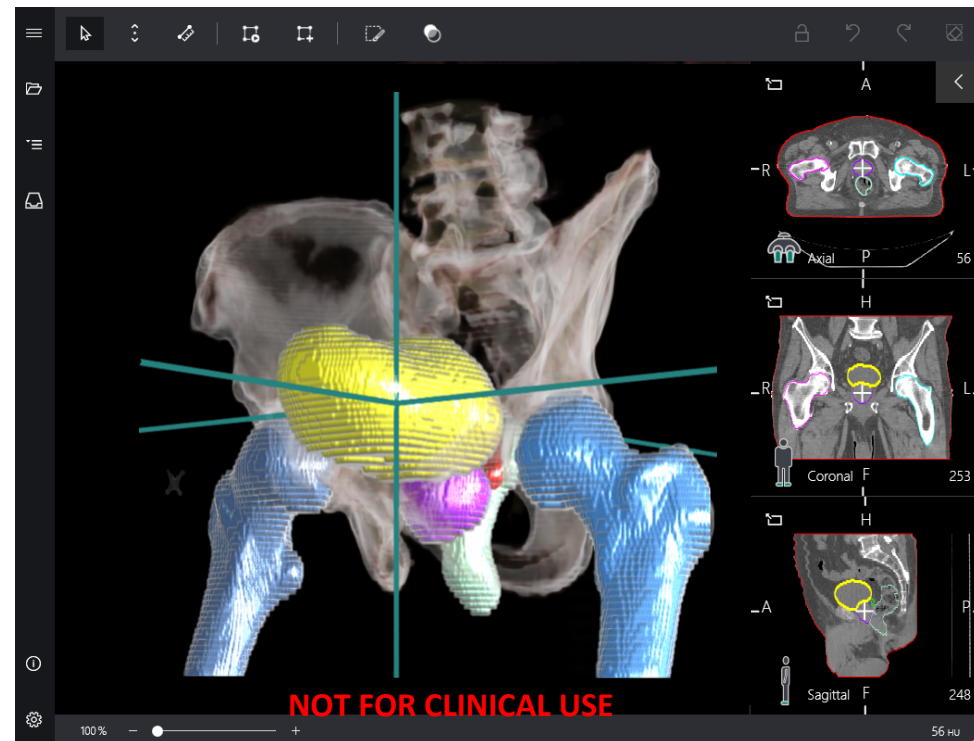
The 3D image segmentation app



Efficient segmentation
of anatomy and
pathology



FDA 510(k) clearance received on
Dec 28th 2017 as class II medical
device.



ML segmentation of a prostate structure set



Loading CT DICOM image

Selecting the ML model: ProstateRT

Applying the ML in the cloud (approx. 58 seconds)

- De-identifying the image
- Compression and transmission to the cloud
- Returning the contours

Visualization of the contours axial and in 3D

Microsoft Radiomics - Mr 5 Wijnen

NOT FOR CLINICAL USE

Send Feedback

POINTER SCROLL MEASURE AUTO STRUCTURE SET NEW STRUCTURE INTERPOLATE SLICE UNDO REDO UNDO ALL

Explorer

Type here to search

12:47 PM 6/13/2018

Responsible AI – it's all about Integrity & Trust



Health



Reproducibility



Explainability



Security

Integrety - Trust

7 key requirements that AI systems should meet in order to be deemed trustworthy

1. Human agency and oversight
2. Technical Robustness and safety
3. Privacy and data governance
4. Transparency
5. Diversity
6. Societal and environmental well-being
7. Accountability



PRINCIPLED ARTIFICIAL INTELLIGENCE

A Map of Ethical and Rights-Based Approaches

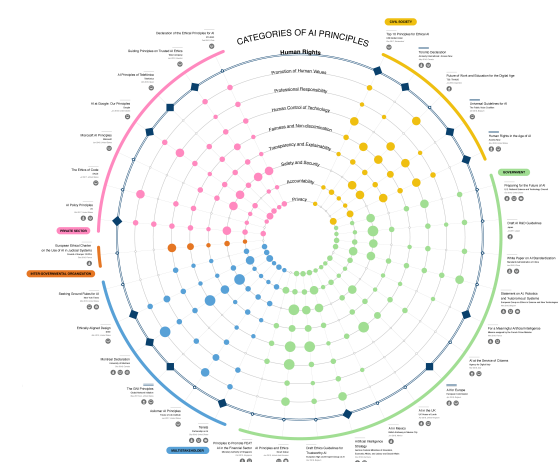
DRAFT - July 4, 2019

Authors: Jessica Peck, Thomas Hilgus, Felix Achten, Mark van Dam, Janine Peeters, Gita Kagay
Design: Ansh Singh (ansh@hinge.net)

As despite the rapid development of artificial intelligence, we've seen a proliferation of AI "principles" or guidelines for how AI should be built and used. Is there enough consistency among these efforts to suggest the emergence of a sector norm? Where and the most significant points of divergence?

This visualization presents thirty-two sets of principles side-by-side, enabling comparison between efforts from governments, companies, advocacy groups, and multi-stakeholder initiatives. It highlights eight shared themes: accountability, fairness and non-discrimination, human control of technology, privacy, proportional transparency, protection of human rights, safety and security, and transparency and explainability, and documents where reference is made to international human rights. Our dataset is not exhaustive, but offers a snapshot of prominent, recent AI principles.

The Principled Artificial Intelligence project will also publish a white paper and the nearest final of an [AI Charter and Safety](#), where you can learn more about our assumptions, methodology, and key findings. It is our hope that this project serves as a starting point for further developing and clarifying



How to Read

Color Legend

- Yellow: Human Rights
- Blue: Accountability
- Green: Safety and Security
- Orange: Proportional Transparency
- Pink: Privacy
- Light Blue: Fairness and Non-Discrimination
- Light Green: Human Control of Technology
- Light Orange: Transparency and Explainability

Shape Legend

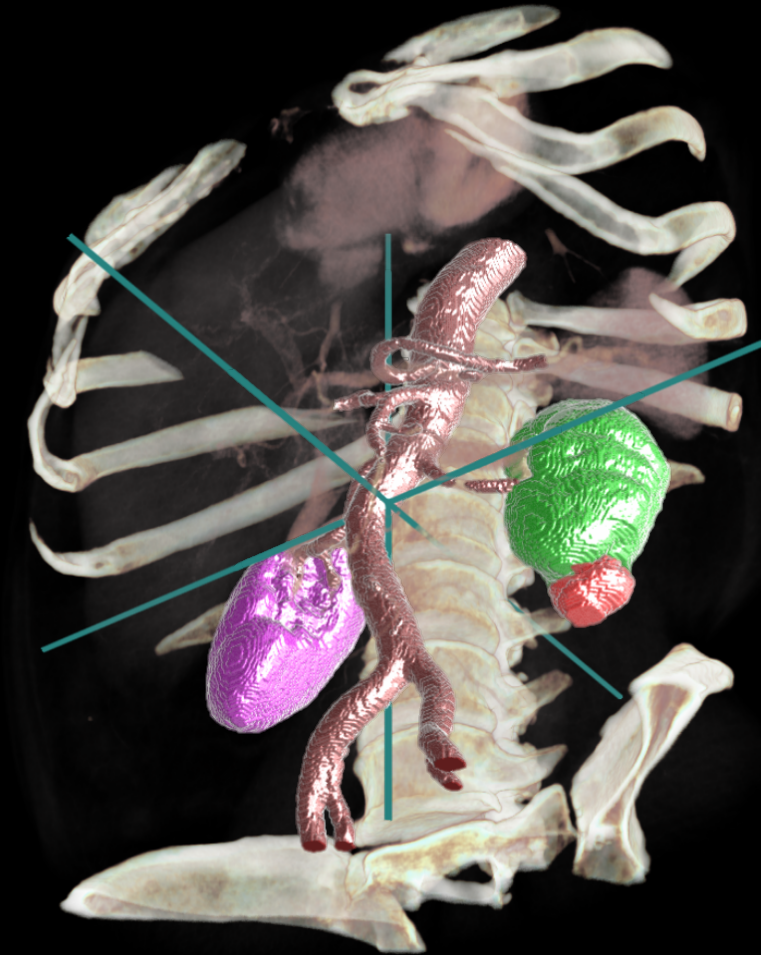
- Circle: Principle
- Square: Reference to International Human Rights
- Triangle: Reference to AI Principles
- Diamond: Reference to AI Principles

Legend for Document Timeline

- Vertical bar: Document
- Color: Document Category
- Length: Document Duration
- Position: Document Start/End Date

Document Timeline





Other A.I. Possibilities

Medical conversations to medical intelligence



Project EmpowerMD

Medical conversations to medical intelligence