The role of AI in the VHT

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AIM

Review together the *envisioned* role of Artifical Intelligence in the context of Virtual Human Twin (VHT) in healthcare and clinical practice.

Agenda

- Working definition AI in the context of VHT
- Review *EDITH* envisioned role(s) of AI in VHT platform and its deployment
- Collecting Feedback
- Discussion

AI and ELSI in VHT

Ramifications of incorporating AI will certainly lead to Ethical, Legal issues.
However, this topic will **not** be covered in-depth here

Please find the parallel session "Social acceptance and trust"

"Draft" definition of Artificial Intelligence (AI)
in the context of VHT

- AI can refer to the advanced computational technologies that **will enable** the simulation, prediction, and replication of human physiological and pathological processes.
- This encompasses machine learning algorithms, data analytics, and neural networks that can process vast amounts of health data. AI in this domain should be **characterized by its ability to learn from and adapt to new information**, leading to better prediction of health outcomes, provide personalized medical insights, and support clinical decision-making.
- Its role extends to the **continuous updating and refining of the virtual twin** as new data becomes available, ensuring an ever-evolving and accurate digital representation of the individual's health status. This form of AI will be pivotal in advancing precision medicine, enhancing patient care, and contributing to the broader understanding of human health and diseases.

AI utilisation in DT

- Ability to assess more systems (heart models based on image processing, candidate compounds for drug treatment, …)
- Surrogate models or ML based PDE solvers in multiscale models or clinical decision support
- Parameter tuning for personalised mechanistic models based on the individual's data
- Tension between data driven predictive AI/ML models and the need to be explainable (e.g. integration of prior mechanistic knowledge)
- Automating iterative approach to hypothesis generation and testing for mechanistic multilevel models

AI utilisation in VHT platform

1) **Data and model integration** (knowlegde graph)

- data-data: harmonisation of formats
- data-model: take given input data and convert to a suitable input for relevant model(s)
- model-model: map outputs from one model suitable as input for another

2) **Resource orchestration & continuous updating of digital twins** (DTs) : recommender system for workflows, …(should be vs could be)

3) **Evaluation** (and credibility scoring) **of data and DT model quality for imported** within the platform utilizing LLMs

4) **Chatbot interface to the VHT platform** with LLM tailored to the VHT platform
Example: Bibliography support with the WebApp
(registration through https://www.edith-csa.eu/edith-knowledge-base/)

EDITH needs you

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AI Breakout session questionnaire

Join at menti.com | use code 7481 2882

Instructions

Go to

www.menti.com

Enter the code

7481 2882

Or use QR code

Plenary discussion

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Topic 1: Integration of data and models

Naming: data, model, data set, measurements

Information retrieval: from literature/measurements to knowledge DB

Data and model integration (knowlegde graph)

- data-data: harmonisation of formats --> elaborate more
- data-model: take given input data and convert to a suitable input for relevant model(s)
- model-model: map outputs from one model suitable as input for another

Topic 2: Resource orchestrations

- 2) **Resource orchestration & continuous updating of digital twins** (DTs) recommender system for workflows, …(should be vs could be)

Topic 3: Credibility scoring

- 3) **Evaluation** (and credibility scoring) **of data and DT model quality for imported** within the platform utilizing LLMs

Topic 4: LLM chatbot tailored to VHT

4) **Chatbot interface to the VHT platform** with LLM tailored to the VHT platform
Example: Bibliography support with the WebApp
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Topic 5: Emergent topics

Open discussion

http://www.edith-csa.eu

Deliverables available under tab ‘dissemination/material’

Indication of interest via de contact form on site

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