

Navigating the challenges of processing distributed medical data

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Modern software solutions in computational medicine, including decision support systems, are critically dependent on the availability of data which is required to fine-tune DSS algorithms, train AI models, perform verification and validation of resulting software, and assist in the certification process. However, obtaining such data is often cumbersome and involves legal obstacles. In many cases medical records cannot be exported outside of their originating institutions, or require verifiable anonymization and protection at processing sites. In this presentation we report on our work on solutions which aim to alleviate these issues, among others by implementing federated learning algorithms at multiple sites where models can be trained without physically transferring data, as well as aggregating and securely managing medical data at HPC infrastructures, where large-scale computational models can be safely executed - which includes the ability to publish results of computations in accordance with Open Data principles. We provide examples of successful projects currently underway at Sano, and also highlight our plans for further work on overcoming these issues. We also touch upon changes in the legal landscape surrounding secondary use of medical data (including for research purposes). This publication was created within the project of MSHE "Support for the activity of Centers of Excellence established in Poland under Horizon 2020" on the basis of contract number MEiN/2023/DIR/3796. This project has received funding from the EU's H2020 research and innovation programme under grant agreement No 857533. This publication is supported by Sano project carried out within the International Research Agendas programme of FNP, co-financed by the EU under the European Regional Development Fund.

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