Beitrag ID: **125** Beitragskennung: **84** Typ: **Poster**

Privacy-preserving federated prognostic model learning from multi-centric questionnaire data to predict pain changes in osteoarthritis

Multi-centric patient-derived data typically is decentralized and can not be integrated into one datacenter for privacy reasons. We address this problem using federated learning to train logistic, linear, and random forest regression models in a privacy-preserving fashion across data from multiple centers. We utilize data from GLA:D® osteoarthritis registries and compare federated models against models trained locally and models trained on the full data in a centralized fashion. We demonstrate that models trained in a federated, privacy-preserving fashion achieve performances comparable to those trained in a centralized fashion on the full data, but outperform models learned from smaller, local datasets. In summary, we proved the applicability of federated learning for prognostic model acquisition from multi-centric questionnaire-based healthcare data.

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Keywords

Federated Learning
Questionnaire data
Osteoarthritis
prediction model

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