DISTRIBUTED LEARNING FOR EVIDENCE-BASED MEDICINE

MEDICAL FIELD, OR MEDICAL METHOD

Radiotherapy / Radiology / Research

TYPE

☐ Decision support   ☐ Autonomous decision making

CATEGORY

☐ Prevention ☐ Detection ☐ Diagnosis ☐ Treatment
☑ Other

DESCRIPTION

Distributed Learning infrastructure that promotes global evidence-based medicine while prioritizing patient privacy as well as ethical and political concerns around sharing access to data.

AIM / PURPOSE

To enable collaboration between hospitals across regions and countries while making sure that individual patient data does not leave the owning institution.

OUTPUT / RESULTS

The infrastructure demonstrably overcomes patient privacy barriers to healthcare data sharing and implements distributed data analysis and machine learning across healthcare providers worldwide. Several research projects have already taken advantage of this infrastructure.

AI METHODOLOGY

Any type of AI can be applied that can be trained on distributed data sets. The machine learning algorithm needs to be divided into a master component (on the central server) and a site component (at each center). Only summary statistics and coefficients are exchanged with the central server.

INPUT / SIZE OF THE DATA

Depends on the project and research topic. This scales with each added center. The most recent project did survival modelling on 27k+ patient cases across 7 centers in 5 countries.

REFERENCE DOCUMENTS / LINKS / PUBLICATIONS

Distributed learning on 20 000+ lung cancer patients – The Personal Health Train; Deist, Timo M. et al.; Radiotherapy and Oncology, Volume 144, 189 –200; *https://doi.org/10.1016/j.radonc.2019.11.019*

SOURCE

Varian

COCIR, the European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry