Fyrirlestur

Prof. Olaf Dössel

„Machine Learning in Medical Systems“

er boðaður af Heilbrigðistæknifélagi Íslands, Háskólanum í Reykjavík og Landspítala – háskólasjúkrahúsi

mánudaginn 8. maí 2023 klukkan 14:00

í Háskólanum í Reykjavík, stofu M208

Aðgangur er ókeypis.

Machine Learning (ML) is on the way to become one of the most important tools in Medicine, Medical Informatics, Medical Engineering and Medical Physics. Increasing computing power and availability of large data sets is currently boosting options of better health care covering all aspects from prevention, diagnosis, therapy and care to rehabilitation. The lecture will start by giving some examples out of various areas of application. Concepts and algorithms will be outlined briefly. Clearly, prerequisites of any application of ML in Medicine are reliability and safety, robustness, transparency and explainability, trustworthiness, non-discrimination (“no bias”). But how can we measure these distinguishing features of ML software in medicine? We need standardized test procedures and quantification of quality including uncertainty quantification. How do we get data of good quality and still comply with the laws of data protection and privacy? We must enable research to uncover the treasures hidden in the data and to turn medical data into valuable information.
The lecture will also shed light on frequently asked questions in respect to ethics, responsibility / accountability and legal issues of ML in Medicine.

Prof. Olaf Dössel:

Olaf Doessel is Professor and until his retirement in 2022 he was head of the Institute of Biomedical Engineering at Karlsruhe Institute of Technology (KIT). Before, he was head of a research department at Philips Research Laboratories in Hamburg. He has several honorary posts in international advisory boards. He is member of several academic societies, among them: the Academy of Science of Berlin-Brandenburg (BBAW) and the German Academy of Technical Sciences (acatech). He is Fellow of the International Union for Physical and Engineering Sciences in Medicine (IUPESM), the International Academy for Medical and Biological Engineering (IAMBE), the European Alliance for Medical and Biological Engineering & Science (EAMBES) and the German Association of Biomedical Engineering (DGBMT). His main interests are bioelectric signals and fields in the human body, computer modeling of the heart, the inverse problem of electrocardiography, biosignal processing of ECG and electrograms, and new methods of medical imaging.

Vélarnám (machine learning) er að verða eitt mikilvægasta tól læknisfræði, heilbrigðisupplýsingafræði, heilbrigðisverkfræði og heilbrigðiseðlisfræði. Aukin reiknigeta og aðgangur að stórum gagnasöfnum er hröðum skrefum að auka möguleika á betri heilbrigðisþjónustu. Allt frá forvörnum, sjúkdómsgreiningu, meðferð og að endurhæfingu. Fyrirlesturinn byrjar á nokkrum dæmum um notkun vélarnáms. Hugmyndir, hugtök og algrím verða skýrð stuttlega. Augljóslega eru forsendur notkunar vélarnáms í heilbrigðisþjónusu áreyðanleiki, öryggi, þol, gegnsæi og skýranleiki, traust og án mismununar. Hvernig er hægt að mæla eða meta þessa mismunandi eiginleika vélarnámshugbúnaðar í læknisfræði? Við þurfum stöðluð próf og mælanlega skilgreinda gæðavísa að meðtöldu óvissumati. Hvernig fáum við gæða upplýsingar umleið og við gætum að lögum um gagna- og persónuvernd. Við verðum að gera rannsakendum kleift að nálgast falda fjársjóði læknisfræðilegra gagna til að gera úr þeim verðmætar upplýsingar.
Fyrirlesturinn mun einnig leita svara við algengum spurningum um siðfræði, ábyrgð og lögfræðileg álitamál notkunar vélarnáms í læknisfræði.