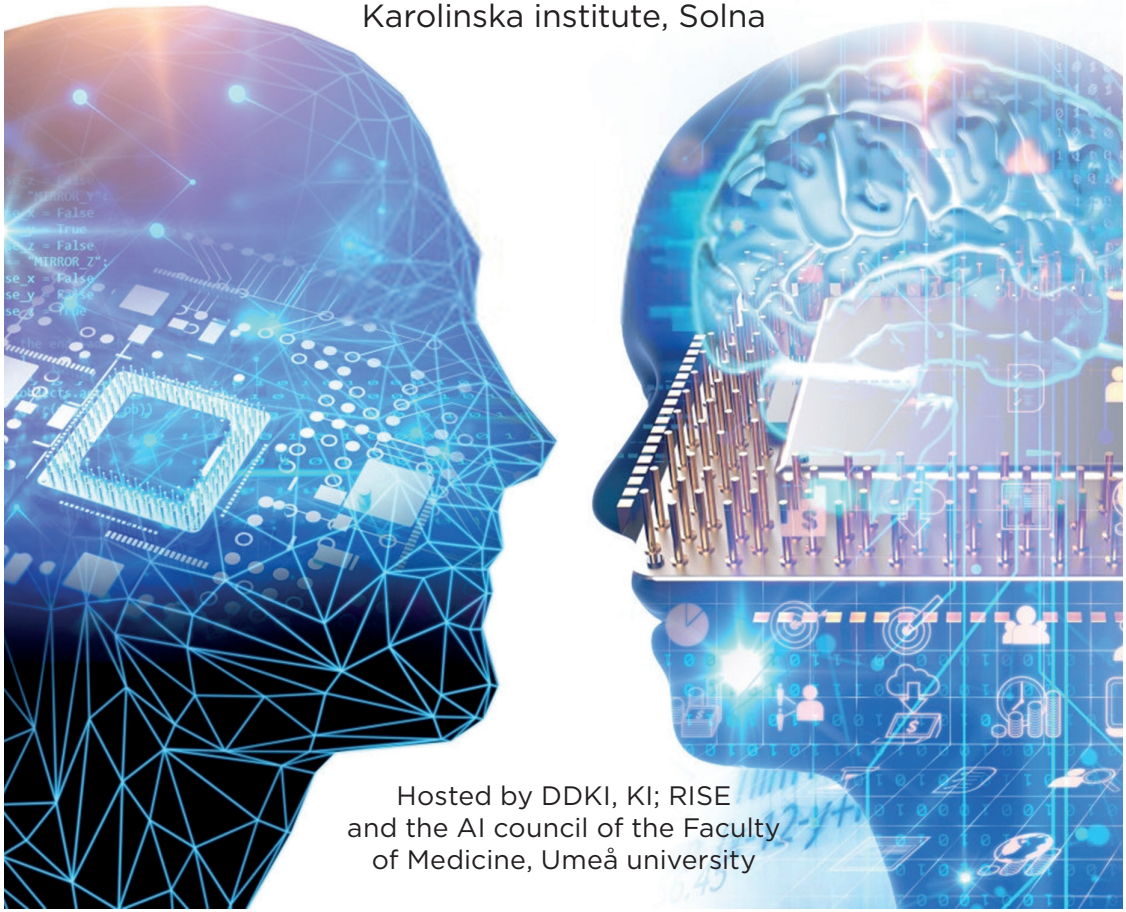
AI IN PRECISION MEDICINE

– latest development and future directions

Mini-Symposium May 27th, 2024
10:00–12:30

Eva & George Klein lecture hall
Floor 3 in Biomedicum
Karolinska institute, Solna



Hosted by DDKI, KI; RISE
and the AI council of the Faculty
of Medicine, Umeå university

RI.SE Research Institutes of Sweden

NDPIA

Karolinska Institutet

UMEÅ UNIVERSITY

10:00–10:10 Welcome remarks

Jenny Persson, Chair of AI Council, Umeå University; Hanifeh Khayyeri, Director of CS department, RISE; Mattias Rantalainen, Karolinska Institutet.

Chair of the first session: Fehmi Ben Abdesslem, RISE

10:10–10:30 Using machine learning for the discovery of microbial biomarkers for diseases

Jacob Wirbel, School of Medicine, Stanford University, USA

PhD, Researcher at the Department of Hematology. Jacob has research expertise on developing AI machine learning and statistical tools for the analysis of microbiome data. His current research is focused on precision microbial genomics in the context of cancer

10:30–10:50 Foundation Models for Scientific Discovery: A Case Study on Combining LLMs and Bayesian Optimization for Molecules

Geoff Pleiss, University of British Columbia, Canada

PhD in computer Sciences. Assistant professor at Department of Statistics. Geoff also serves as Canada CIFAR AI Chair affiliated with the Vector Institute in Ontario. He specializes in machine learning methods for scientific applications, emphasizing decision making, robust and reliable predictions, and scalability. His research and innovation cover the topics across machine learning and statistics, including neural networks, uncertainty quantification, Gaussian processes, spatiotemporal modelling, and AI innovation.

10:50–11:20 Coffee Break

Chair of the second session: Shireen Sindi, DDKI at Karolinska Institutet.

11:20–11:40 Finding diagnostically relevant tissue patterns by self-supervised learning

Carolina Wählby, Uppsala university, Sweden

PhD in digital image analysis. Professor at Department of Information Technology. Carolina also serves as Scientific Director of the Swedish National SciLifeLab Bioimage Informatics Unit. Her research is focused on developing computational approaches for extracting information from image data with applications in life science; primarily at the microscopy scale. Methods include traditional image analysis and computer vision technology as well as AI and deep learning. The goal of the analysis ranges from predicting and understanding dynamics of cancer cells to fast antibiotics susceptibility testing and 'functional pathology' combining tissue morphology with spatial transcriptomics.

11:40–12:00 Using machine learning to find biomarkers in Parkinson's disease eye tracking data.

Erik Fransén, KTH Royal Institute of Technology, Sweden

PhD, KI StratNeuro faculty. He leads research in computational biology including biomarker discovery using machine learning in tremor patients (Parkinson's disease, ortostatic tremor) and patient specific respiratory parameter estimation in collaboration with Getinge AB. He also leads projects in statistical modeling of proteomics data of brain synapses including mouse genetic models of intellectual disabilities (SynGAP, schizophrenia).

12:00 –12:20 AI-based precision pathology – novel and scalable solutions for cancer patient stratification using real-world data.

Mattias Rantalainen, Karolinska Institutet, Sweden

PhD, Associate Professor at Department of Medical Epidemiologi and Biostatistics (MEB), Karolinska Institutet. Mattias leads the Predictive Medicine Group at MEB. He is the co-founder and CTO of Stratipath – a company developing AI-based precision pathology solutions for clinical use. He is the PI for the CHIME project at Karolinska Institute, focused on large population representative studies in computational pathology. He is also the PI of the Swedish AI Precision Pathology (SwAIPP) consortium, and the ABCAP consortium, which are both focused on developing and translating AI-based computational cancer precision pathology. He is also leading the initiative "Data-Driven Research at KI (DDKI)" at Karolinska Institutet.

12:20–12:30 Conclusion Remarks

Fehmi Ben Abdesslem, Mattias Rantalainen, Shireen Sindi

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