

# AMIA 2019 Symposium

Informatics: From Data to Knowledge to Action

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HOW TO DEPLOY MACHINE  
LEARNING (ML) MODELS  
IN PRACTICE?

AUGMENTED INTELLIGENCE

DATA QUALITY ASSESSMENT

THE BLOCKCHAIN  
IN HEALTHCARE

LEARNING HEALTH  
SYSTEMS (LHS)

NATURAL LANGUAGE  
PROCESSING (NLP)  
AND PHENOTYPING



The AMIA Symposium is a leading forum for biomedical informatics discussion and had an attendance of just over 2000 delegates in Washington DC, including six attendees from Norwegian Centre for E-health Research. The symposium draws participation from clinicians, researchers, industry professionals, educators, scientists, policy makers and even talented high school students. There is also a wide range of activities, including exhibitions, networking events, workshops, panels and system

demonstrations. This report summarizes some of the hot topics that received attention at sessions we attended. An underlying theme that permeates much of healthcare data discussion is, of course, privacy and patient trust. The other important topics were how to deploy machine learning (ML) models in practice, augmented intelligence, data quality assessment, blockchain in healthcare, learning health systems (LHS), natural language processing (NLP) and phenotyping.

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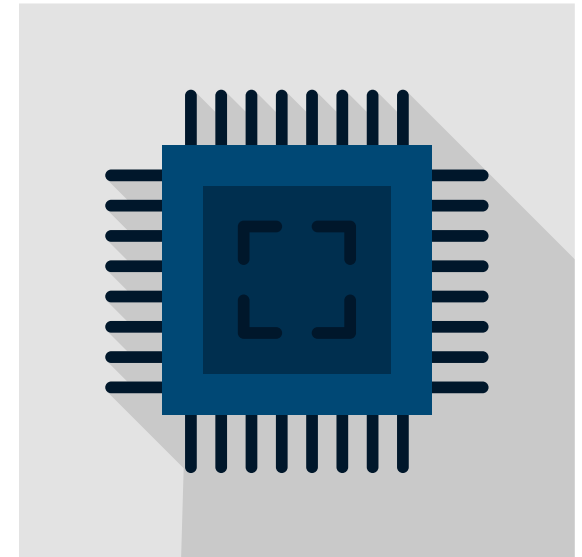
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# How to deploy Machine Learning (ML) models in practice?



An emerging trend in the conference: how to deploy Machine Learning (ML) models in practice? This topic covers a wide spectrum of questions ranging from technical to organizational. Many of them were presented at the conference in the form of technical workshops, presentations and panel discussions that delved deeper into organizational aspects. A session titled “Models to practice” highlighted the fact that currently the majority of fails happen “not in detection, but in action”. We already produce models of reasonable quality, but questions on who is receiving the output of the model, how, when and what do they do with it require more attention.



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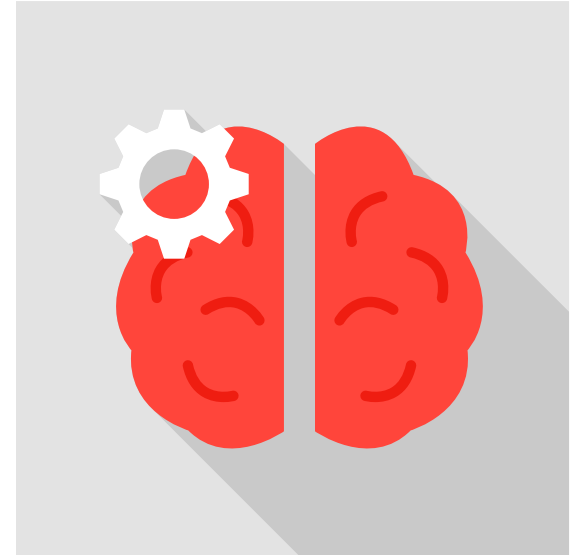
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# Augmented intelligence



Near future attention of Artificial Intelligence (AI) in health care should be on augmented intelligence where the purpose is to support health care workers rather than to develop full automation tools. Health care delivery systems should utilize AI applications in the framework of a learning health care system which is a context used for improving health care. There is a need of multidisciplinary AI training and educational programs that involve developers, implementers, leadership, clinical teams, ethicists, patients and caregivers. This was the message from the presenters who, on behalf of the National Academy of Medicine (NAM) at the AMIA 2019 symposium, presented the newly published report Artificial Intelligence in Health Care: the Hope, the Hype, the Promise, the Peril. The report is particularly written for key stakeholders such as AI model developers, clinical implementers, clinicians and patients, regulators, and policy makers. The existing and near-term AI solutions are presented, as well as the challenges, limitations, and best practices for AI development, adoption, and maintenance.



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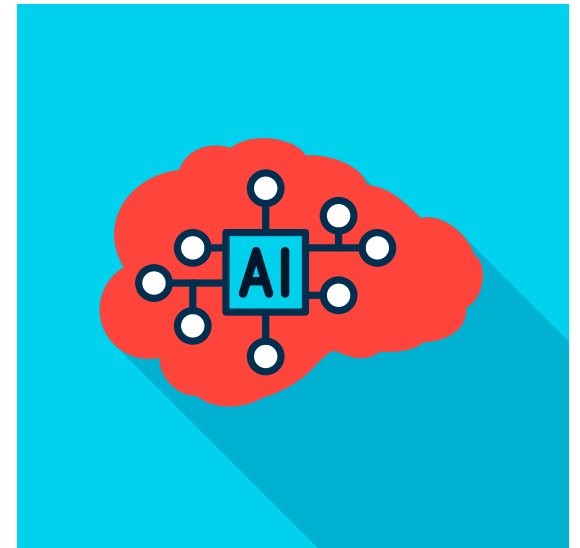
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# Data quality assessment



An important and emerging topic presented in the conference this year is about the need and challenges for data quality assessment in health analytics and how AI can help to improve data quality. One initiative in USA is the All of Us Research Program, which is building one of the largest biomedical data resources of its kind. The program will store health data from one million or more diverse participants.



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# The Blockchain in Healthcare



Another topic that received attention is related to the Blockchain and its application in the biomedical, healthcare and genomic research. For instance, using blockchain smart contracts to implement health care data access control and consent management in clinical trials. A combination of blockchain with HL7's FHIR was presented as a scaled solution for sharing healthcare data in a secure manner.



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# Learning health system (LHS)



LHS is a topic that has received wide attention in recent years, and several panel sessions at the conference addressed the topic. Different perspectives were presented, including from the patient perspective, where patient-identified goals are moved to rapid and continuous learning to improve patient outcomes. Another perspective was from a learning electronic health record (EHR), where machine learning is used to predict and highlight information that the clinician will likely need on the EHR user interface.



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# Natural language processing (NLP) and Phenotyping



Judging by the number of sessions dedicated to NLP-related work, it is arguably one of the most popular topics for the whole conference. One session presented technical work implementing large NLP systems using Docker and Kubernetes, while most other sessions covered a wide array of clinical applications. The unstructured data used in presented studies varied from EHR data to social media data and scientific articles and abstracts. Also, unstructured data is often used, based on NLP methods, to enhance phenotyping.

