

Role of Deep Learning and Artificial Intelligence in Clinical Decision Support for Imaging

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With the advent of new machine learning techniques, the field of automated clinical decision support is poised for a new growth. Previously, the decision support systems have been predominantly rule-based and built on fixed pre-determined associations from clinical knowledge. The IBM AALIM system pioneered a new direction in evidence-based medicine using the concept of patient-data driven learning by exploiting the consensus opinions of other physicians who have looked at similar patients. With the advent of deep learning methods, learning-based decision support can be combined with clinical knowledge-driven techniques to define the next generation of clinical decision support systems.

In this talk, I will discuss the role of deep learning techniques in decision support giving examples in radiology and cardiology imaging. I will also describe the IBM Medical Sieve Radiology Grand Challenge, a worldwide collaborative research effort across IBM research labs that is expanding patient data and knowledge-driven learning to define new clinical decision support systems for radiologists that will one day serve as their cognitive assistants.