

Promise and Peril in Machine Learning

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Summary

Machine learning as a research topic started as a subfield of artificial intelligence several decades ago but has grown to become a major area within computer science in its own right. In particular, in the past few years machine learning has played a key role in application areas such as computer vision, speech recognition, Web search and advertising, and more. The field is enjoying continued attention with the resurgent interest in neural network models and the broad interest outside computer science in topics such as data science and “big data”. In this talk we will discuss some of the reasons behind the success of machine learning, including the implicit adoption of ideas from statistics, the development of scalable optimization methods, and the use of very large labeled data sets. In addition to the success stories we will also pay attention to limitations and failure modes of existing approaches such as the limited ability of current models to generalize to new situations. The talk will conclude with some speculative guesses at where research and applications in machine learning might be headed over the next decade.