Artificial Intelligence and Deep Learning

Session Co-Chairs:
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Abstract:

The birth of Artificial Intelligence (AI) in the 1950s sparked a computing revolution that has since transformed human lives in almost every sector from communication and finance to health and automotive industry. Significant research advances in the underlying general field of machine learning and more specifically deep learning have helped catapult our ability to build automated intelligent systems capable of sensing and understanding the real world from text, speech and images. Deep learning and machine learning in general have led to faster and better computing machines capable of human-level performance on visual recognition and other AI tasks. Moreover, these technologies have enabled a variety of practical applications that benefit our personal lives on a daily basis. At the same time, there are several fundamental challenges facing deep learning and AI today that require innovations from interdisciplinary researchers.

The session *"Artificial Intelligence and Deep Learning"* will highlight the interdisciplinary challenges and research advances on underlying topics in this field. It will cover perspectives on core machine learning challenges as well as different AI applications and will feature speakers from both academia and industry with cross-disciplinary backgrounds.

This session will begin with an introduction on *AI and Deep Learning*, current state and outlook on where it is headed. Next, the session will dive deep into some of the major challenges in deep learning from dealing with data scarcity to designing efficient learning algorithms. The session will then take a closer look at conversational assistant technologies and the long-standing AI challenges involved in building machines that can communicate with people. We will then transition from language to vision with a discussion on deep learning technologies used for human and object recognition in many visual applications including aerospace, autonomous driving and virtual reality. Finally, the session will conclude with a talk on machine learning for cognitive neuroscience applications using causal representations and development of brain-computer interfaces.

Speakers:

Introduction

Software 2.0: Machine Learning is Changing Software
Chris Re. Associate Professor, Stanford University, Palo Alto, USA.

Teaching Machines to Communicate with People using Deep Learning
Zornitsa Kozareva. Manager, Google, Mountain View, USA.

Deep Learning for Visual and Virtual Worlds
Eleonora Vig. German Aerospace Center (DLR), Munich, Germany.

Artificial Intelligence in Cognitive Neural Engineering
Moritz Grosse-Wentrup. Professor, Ludwig-Maximilians-Universität München, Munich, Germany.