Deep Learning Indaba Fact Sheet

The Deep Learning Indaba's aim is to strengthen African machine learning. This is of critical importance since Africans must be contributors, shapers and owners of the coming advances in artificial intelligence, and the coming changes this will have in our communities.

- Strengthening African machine learning; an overview of our aims
- On African participation in machine learning
- Diversity of our speakers

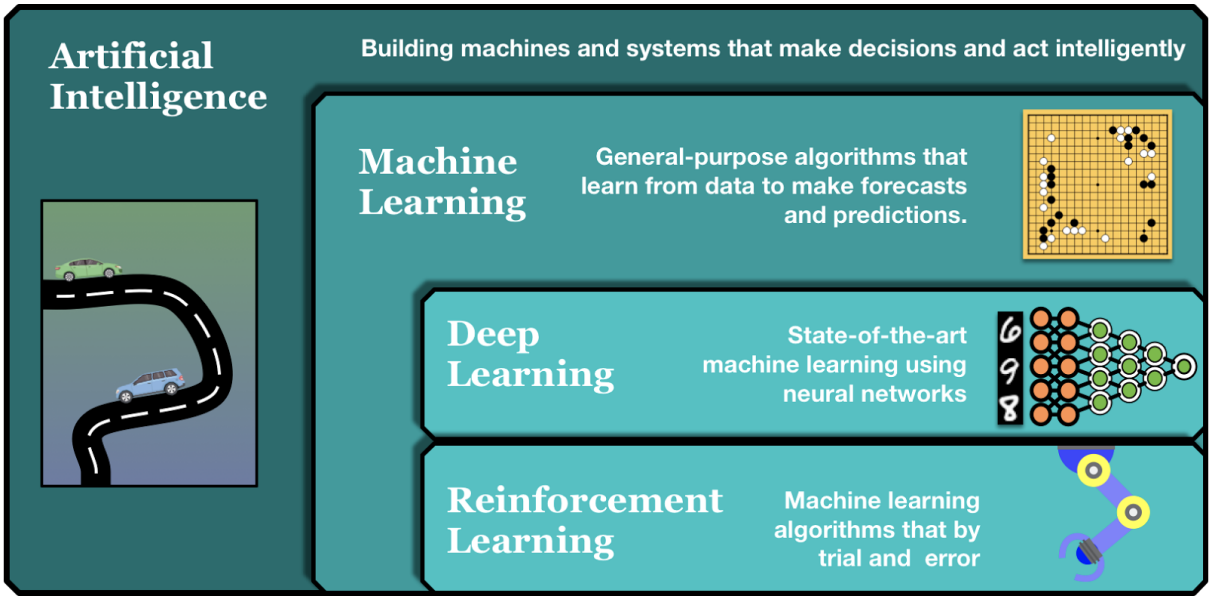

Figure: Diagrammatic summary of key terms and topics that will be explored at the Indaba.

Artificial Intelligence (AI) is the encompassing name for all research that aims to develop machines (e.g., computers, robots, embedded devices) with similar types of intelligent behaviour exhibited by humans. These aspects of intelligence include solving tasks, forming plans, abstract reasoning, using memory of past events to influence future decisions, and the use of language, amongst others. We often refer to Artificial General Intelligence (AGI) to emphasise that the ultimate aim is to develop a general solution that can perform all these tasks in a single system.

Machine learning is the research area that develops general-purpose algorithms that can learn from data to solve a particular task. These tasks can include predictions of future events, simulations of system behaviour, recommendations, or explanations. Machine learning combines statistics with computer science and engineering to build systems that can be as accurate as possible while also handling large amounts of data. Because machine learning provides particular solutions, these individual solutions form the basis of developing AGI systems.

Deep learning is one type of machine learning that uses deep neural networks. A neural network is a set of calculating units that are stacked upon each other and which can be easily trained using data; this stack is called deep since many layers of calculating units are used. Deep learning is the basis of recent advances in text-to-speech systems, language translation and object recognition. The success of deep learning is one of the reasons for the recent and rapid advances in artificial intelligence research.

Reinforcement learning is the part of machine learning that deals with teaching machines to learn by trial-and-error, using rewards and punishments. By striving to accumulate the largest amount of reward, and artificial agent can learn to develop strategies and solutions to problems without being given explicit solutions to those problems. Deep learning and reinforcement learning have been recently combined into the area of deep reinforcement learning.