



Overview of Research at Istituto Dalle Molle di Studi sull'Intelligenza Artificiale (IDSIA)

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At IDSIA we focus on various aspects of machine learning, including:

Artificial neural networks

Instead of processing information in a sequential way by hand-designed algorithms, information can be processed by a network of simple units. Each unit only sums its inputs and applies a nonlinear transfer function. Given enough parameters, such a network can approximate any function that maps high-dimensional input to desired outputs like classification of objects. Efficient ways of learning these parameters are subject of current research. ANNs are currently the best performing method in image classification and are applied also in many other fields.

Recurrent neural networks

ANNs that include their previous state in the calculation via cyclic connections can be viewed as a form of memory. This makes them powerful tools to process sequential data such as audio signals, mechanical systems, financial or environmental data. IDSIA is the home of an especially successful architecture called “Long-Short-Term-Memory”.

Reinforcement learning

For many real world applications, it is unfeasible to obtain large amounts of training data that is required for supervised learning. Instead, a problem solving strategy has to be found from repeated trial and error.

In PROTOTOUCH we apply these novel information processing techniques to assist in design and simulation of tactile devices, as well as to extract meaningful information from large datasets from experiments.

People involved in the project:

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