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# Sigma

Computers learn to learn



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**We aim to improve the efficiency in the field of artificial intelligence by developing a lightweight open source machine learning framework with focus on collaboration and dynamic interaction. Our solution, Sigma, is a modular and customisable building block system whose blocks can be used by anyone to model intelligent behaviour quickly and easily in understandable steps.**

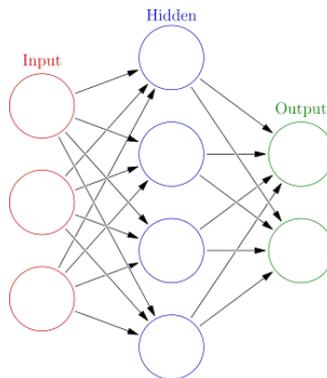
## Introduction

As of now artificial intelligence is programmed for specific tasks and therefore, alternation for contextually different situations might be difficult or nearly impossible. Collaboration and comparison between learning algorithms on even the same data is tedious. The prospects of modular and easy to analyse machine learning frameworks are promising and set the path towards understandable "general purpose" AI.

## Neural Networks

The core of Sigma and an important aspect of machine intelligence research are so-called artificial neural networks, which are loosely inspired by the human brain. These networks consist of thousands of interconnected neurons, each of which contributes a small part of the overall "solution". Similar neurons are grouped into logical layers

which form the building blocks of Sigma. Blocks define how data is processed and thereby the network's behaviour.



*Artificial Neural Network*

## Why Sigma

Unlike most other machine learning frameworks, Sigma was designed with everyone in mind—it is not only easy to use but also completely customisable and flexible. Intended for use on all kinds of devices, Sigma automatically distributes the workload into chunks that can be processed by either multithreaded CPUs or single / multi GPUs.

## Real-time Visualisation

Beyond typical one-way visualisation methods, Sigma provides an advanced visual playground, enabling you to interactively improve and test models – all in real time. Models can easily be shared, exported, and imported – all within the same environment.

## Future

Machine learning is one of the fastest growing fields and is on its way to become *the* most important tool of the 21<sup>st</sup> century. In collaboration with the TUM, we will ensure scientific excellence and distribute Sigma to academic facilities while continuing active development.

