# Keras Toolbox for Scilab

Towards extending Scilab and adding state-of-the-art AI technologies in the scientific computing language.
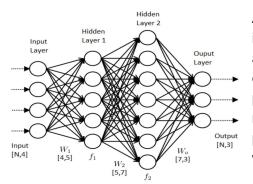
## Abstract:

Scilab is a powerful scientific computing language that is popularly used for research and simulations. But it lacks libraries that can be used to develop artificial intelligence tech, and hence not many publications about AI have preferred to use Scilab for their experiments. There exist some toolboxes for scilab that can be used to develop AI programs. However, usage of these toolboxes is quite complicated, and mandate that the user have extensive knowledge about AI and its internal working. This might be okay for advanced users, but for people with little to no knowledge about AI, this problem can create a knowledge gap and bar said users from getting their hands on powerful AI algorithms and processes. The Keras Toolbox addresses this issue, and thus enables the user to apply AI to their problem without having much in-depth knowledge about it. The toolbox is designed in such a way that the user only has to supply the data, and the AI will configure and train itself automatically. This will be a huge help to researchers who aren't from the programming domain but still want to apply AI to their problem.

This toolbox interfaces and encapsulates the Keras library, which is a python library for AI. You can find its source code [here](#)

The Keras toolbox provides two main functionalities, namely Artificial Neural Networks and Image Recognition.
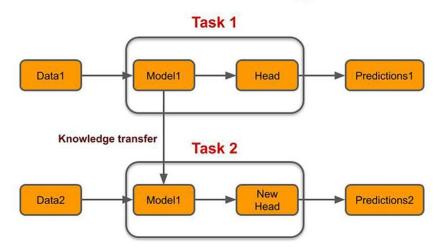
## Artificial Neural Networks:



Artificial neural networks are computing systems vaguely inspired by the biological neural networks that constitute animal brains. Such systems "learn" to perform tasks by considering examples, generally without being programmed with task-specific rules. ANNs consist of many interconnected processors known as neurons that perform summing function. Information is stored in the weights on the connections.

# Image Recognition using Transfer Learning

Transfer learning is a research problem in machine learning that focuses on storing knowledge gained while solving one problem and applying it to a different but related problem. For example, the knowledge gained while learning to recognize cars could apply when trying to recognize trucks.



What separates this toolbox from other available toolboxes such as IPCV is that the usage of this toolbox is fairly simple and intuitive, unlike IPCV which requires the user to have an in-depth understanding of image processing and deep learning. Moreover, the transfer learning module is the latest research in AI-based image processing and hence not available in the IPCV toolbox, hence our toolbox adds a completely new feature to scilab, which is powerful and easy to use. The end goal of this toolbox is to provide users with a simple-to-use, yet powerful AI toolbox so that researchers can use scilab thus increasing the citations of scilab in AI research.

You can read more aritificial neural networks [here](#) and about transfer learning [here](#).

The toolbox provides three python gateway files used to interface the keras library to scilab. They can be run individually (more details available in README.txt) Upon doing so, one will get consistent results from using the scilab toolbox when compared to running the python files individually. Please note that small differences in training accuracies will be there across different executions irrespective of whether they're run from scilab or python, due to the way neural networks work. This however won't have an effect on the end results.