Workshop / Tutorial (ICSB2024)

W6: Introduction to Artificial Neural Networks using Keras

Instructor(s) of the workshop / Tutorial:

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Time duration: **3 hrs**

Abstract : **The aim of the workshop is to introduce neural networks as highly capable machines for all sorts of learning problems one encounters in biology. Toward this, an introduction to representation of learning problems as {T,P,E} is presented. The biological roots of the simplest neural network, i.e, the perceptron, are explored, with its ability to formulate any linear and logistic regression problems. The discussion then moves to multi-layer perceptons before finally introducing deep neural networks (DNNs) and their ability to learn any function, i.e, the universal approximation theorem. DNNs for representative problems in regression and classification are then sketched. Following this, the convolution operation for working with image data is discussed and convolutional neural networks useful for learning spatial relationships are implemented. Then recurrent neural networks for learning sequence relationships are introduced. The session concludes with some applications to systems biology.**

Prior requirement: Knowledge of Python and prior exposure to machine learning concepts may be necessary and helpful.

Do participants need to bring personal laptop? Yes