Deep Learning for High Dimensional and Sparse Clinical Study Data

Centre for Data Analytics

Insight

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Introduction

Mining datasets which contain an over-abundance of features, as well as many missing values is often a problem, and poorly handled by shallow learning architectures.

Objective

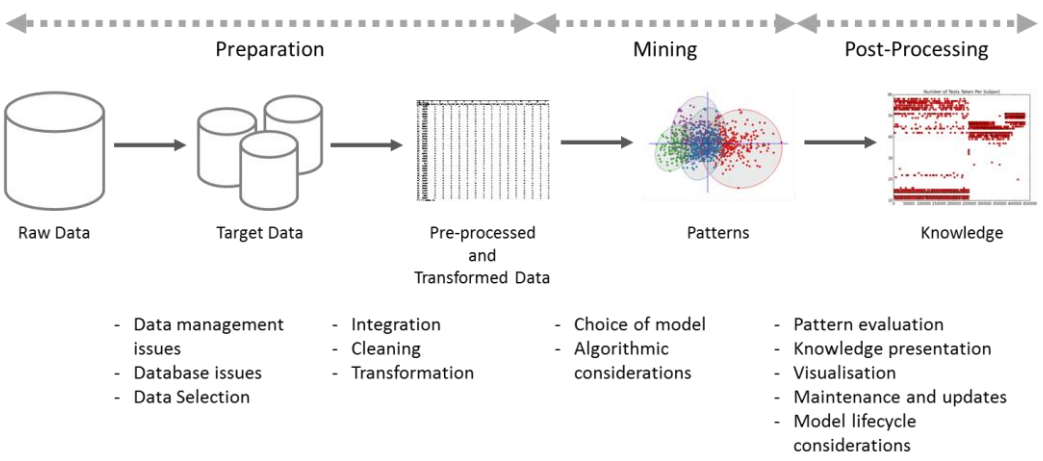
Build an accurate predictive model on a high-dimensional and sparse dataset.

In-MINDD

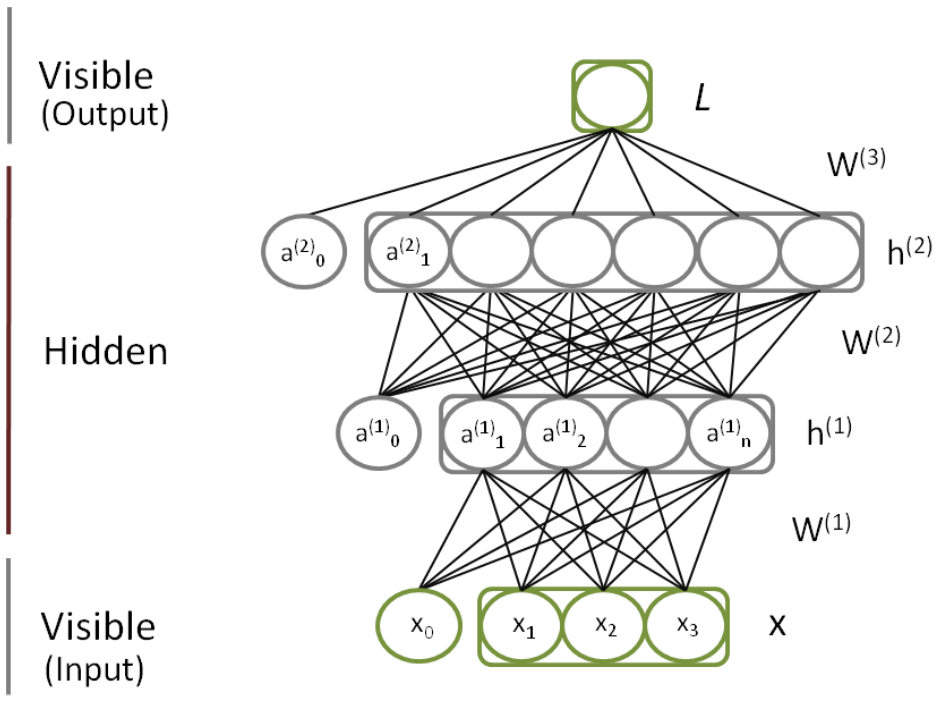
The In-MINDD (Innovative Mid-life INtervention for Dementia Deterrence) project aims to raise awareness and reduce risk of dementia in mid-life adults through an online profiler.

A model of risk factors found by clinical researchers, through a systematic literature review predicts this risk. To evaluate the accuracy of the model, it needed to be validated on the high-dimensional, and sparse Maastricht Ageing Study clinical dataset.

Methodology



Deep Architectures

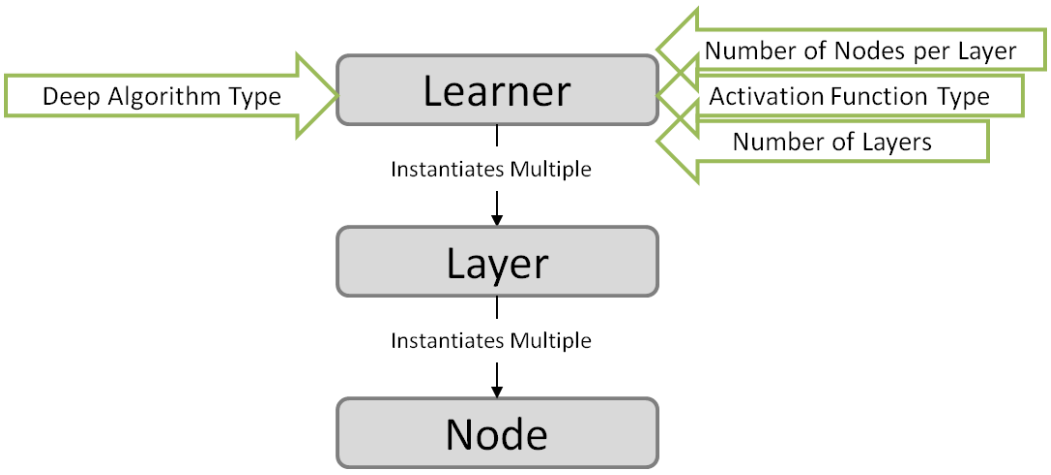


Deep architectures are a family of learning algorithms based inspired by interactions in the brain.

They are neural networks, which are made up of three or more layers of learning functions.

Solution

A software architecture consisting of *Layer, Learner* and *Node* components which allows for the easy implementation and application of different deep learning algorithms to clinical study data, with a view to the architecture becoming data source agnostic.



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