

Assignment 2, What is AI research?

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Own project: Modelling fonts with convolutional neural networks

The main result of the project will consist of a font classifier and a collection of visualizations. The goal of the project is to model/classify fonts using convolutional neural networks and investigate the representations learned by the network. The visualizations will most likely depict the feature representations learned within the network.

The classification system will partly be a type of design science, although the method is not a new one, the application of the system is (i.e. printed characters related to phonemes). It is also a type of formal science, testing if convolutional neural networks can be used for different applications. The evaluation will be done by comparing the results with other image recognition systems. The investigation of the network will formally describe what representations are important for modelling fonts.

A generalization of the problem could be an extension for the system. For instance making it able to recognize handwritten characters as well or combinations of characters or possibly even words. This could be an improvement since it has wider applications but this would also mean more work.

A specification would be to focus on just one writing system instead of multiple scripts. This would mean the system will be tuned for one specific script and this could lead to better results.

Alex Khawalid's project: Causal discovery from multiple observational and experimental datasets in the context of protein signalling networks

The goal of the project is to discover causal relations in combinations of observational and experimental data, with the use of the Joint Causal Inference framework. The framework will be used on smaller datasets than usual to demonstrate that less data can still reliably reconstruct a protein signalling network. The result will thus consist of a scaled version of an existing framework. It will be a system that reconstructs signalling networks from data.

The project is of the formal science type. It will use an existing method on different data to demonstrate its validity by comparing it to existing applications. A generalization of the project will be a Joint Causal Inference framework applicable to different or more complex networks. This would mean it could model intricate biological networks more closely and provide better insights in disease causes.

A specification of the problem would be to use just one type of data (experimental or observational) to create the networks. This seems a less desirable approach since the description mentions that recent work showed that the combination of both data types achieved better results.