Karlsruher Institut für Technologie

Implementation Document (FSD)

Numerical Linear Algebra meets Machine Learning

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January 19, 2019

Contents

1 Success Criteria **3**

2 Changes on the Design **3**

3 The Requirements **3**
3.1 Following Requirements are accomplished 3
3.2 Following Requirements were not accomplished 3

4 Unittests **3**

5 Delays and Problems **3**

6 statistics **3**

7 development model **3**

8 Glossary **3**

1 Success Criteria

Goal is the delivery of a consistent software stack that allows for employing neural networks for the linear system. The ecosystem should allow to train a neural network on selecting a suitable iterative solver depending on the linear system characteristics.

2 Changes on the Design

3 The Requirements

3.1 Following Requirements are accomplished

3.2 Following Requirements were not accomplished

4 Unittests

5 Delays and Problems

6 statistics

7 development model

8 Glossary

Glossary

algorithm In mathematics and computer science, an algorithm is an unambiguous specification of how to solve a class of problems. Algorithms can perform calculation, data processing and automated reasoning tasks.

iterative solver In computational mathematics, an iterative solver does a mathematical procedure that uses an initial guess to generate a sequence of improving approximate solutions for a class of problems, in which the n-th approximation is derived from the previous ones.

neural network The neural network itself is not an algorithm, but rather a framework for many different machine learning algorithms to work together and process complex data inputs. Such systems "learn" to perform tasks by considering examples, generally without being programmed with any task-specific rules.