

ABSTRACT

Thesis: 110 p., 21 fig., 1 tabl., 2 applications, 40 sources.

Object: handwriting recognition.

Subject: handwriting recognition with recurrent neural networks and connectionist temporal classification.

The thesis is devoted to the research of online cursive handwriting recognition with recurrent neural networks with long short-term memory and temporal classification. The paper describes the main approaches to the cursive handwriting recognition with analysis of their strengths and weaknesses.

Connectionist Temporal Classification algorithm was implemented based on software for training recurrent neural network CURRENNT. Software system for analysis, processing and visualization of handwriting data and training, testing and analysis of recurrent neural networks was developed in Python programming language using software system CURRENNT.

Neural network was trained and tested with Unipen and IAM On-Line Handwriting Database datasets. The results are analyzed and presented in tables, graphs and illustrations.

The novelty of this work is adaptation of Connectionist Temporal Classification for parallel computing and applying it for online handwriting recognition.

Further research is recommended in these areas, the possibility of using other neural networks architectures with memory, for example, GRU, analysis of the extended alphabet.

SEQUENCE CLASSIFICATION, SEQUENCE LABELING,
HANDWRITING RECOGNITION, RECURRENT NEURAL NETWORKS,
LONG SHORT-TERM MEMORY, CONNECTIONIST TEMPORAL
CLASSIFICATION