

## ABSTRACT

Thesis work: 123 pp., 41 fig., 6 tabl., 2 app., 49 sources.

DEEP LEARNING, MARKOV DECISION PROCESS, PROXIMAL POLICY OPTIMIZATION, REINFORCEMENT LEARNING, VISUAL NAVIGATION

The object of the research is visual navigation task. The subject of study is application of deep reinforcement learning methods to visual navigation task.

The aim of study is the development and training of decision-making system for visual navigation based on deep reinforcement learning.

This research uses scientific papers and other materials of foreign conferences and achieves in field of computer vision, machine learning, deep learning and deep reinforcement learning.

During the work on thesis a decision-making system was implemented and trained. This system seeks for the shortest path to goal location with quantified success on scenes from both training and validation dataset splits, demonstrating its generalization ability to previously unseen data.

The implementation of model and training infrastructure was written using Python programming language, PyTorch – framework for dealing differentiable computation graphs, and HabitatSim simulator.