

## **ABSTRACT**

Bachelor's thesis: 95 p., 32 fig., 13 tabl., 22 ref., 2 appendixes.

Object of research: Satellite/aerial imagery of city infrastructure.

Subject of research: convolutional neural network image recognition.

Thesis's task is to develop the architecture and algorithm which will perform recognition of a building roof on a localized image of a city infrastructure object.

During the fulfillment of the work the following was performed: analysis of main modern image recognition approaches along with their characterization comparison, an effective algorithm for building roof recognition, a software product implementing the algorithm. The work questions and analyzes usage of convolutional neural networks for building roofs recognition on the satellite/aerial images. The subject relevance is caused by need in regular operational analysis of a territory for composing actual local terrain maps, detection of new facilities or illegal buildings and case of force majeure circumstances such as floodwaters, city fires, et cetera. Information about structure's presence and roof configuration can assist and speed up emergency services.

Results could be used as by commercial organizations, as by government structures such as ministry of emergency situations and as by city administrations.

**SYSTEM OF BUILDING ROOF RECOGNITION, COMPUTER VISION,  
CONVOLUTION NEURAL NETWORKS, BUILDING ROOF IMAGE  
RECOGNITION**