ABSTRACT

The Master's thesis comprises 93 pages, 19 figures, 29 tables, and 35 references.

Research Objective: The objective of this Master's thesis is to analyze the operation principle of a drone with a thermal camera and develop a program for analyzing captured images using neural networks.

Research Methods:

To achieve the research objective, the following methods will be employed:

Literature Review: An analysis of literature will be conducted to study existing thermal cameras and unmanned aerial vehicles (UAVs).

Technical Specification Development: A technical specification will be developed for the program analyzing thermal camera images.

Implementation of Technical Specification: The design of the camera will be carried out, considering the requirements of the technical specification.

Testing: The program will be tested on a specialized dataset.

Research Object: The utilization of machine learning in image recognition.

Research Subject: Methods of automated recognition of people and fire in images from a thermal camera.

Results and Novelty of the Work:

1. The general structure and functioning principle of UAVs and thermal cameras, along with their device composition, have been examined.

2. A neural network has been developed for the analysis and classification of images captured by a thermal camera.

3. The operational capability of the neural network has been tested in two modes:

1. Analysis of individual images.

2. Analysis of a dataset.

Keywords: UAV, THERMAL CAMERA, MACHINE LEARNING, NEURAL NETWORK, CLASSIFICATION, PYTHON.