

ABSTRACT

APPLICATION FOR WEB-BASED PLATFORM FOR IMAGE TAGGING AND ANNOTATION FOR LOCALIZATION AND SEMANTIC SEGMENTATION TASKS IN COMPUTER VISION: diploma project / [Barkaoui Mohamed]. – Gomel: ГГТУ им. П.О. Сухого, 2026. – Diploma project: [96] pages, [6] figures, [5] tables, [14] sources, [14] appendices.

Keywords: image annotation platform, semantic segmentation, object of the localization, bounding box, polygon annotation, web application, ASP.NET Core Web API, C#, REST API, Next.js, TypeScript, Tailwind CSS, JWT authentication, MSSQL, computer vision, dataset labeling.

The object of development is a web-based platform designed to enable users to annotate and tag images for use in computer vision tasks, including object localization and semantic segmentation.

The aim of the work is to develop a comprehensive software solution that provides an efficient, intuitive, and collaborative environment for creating annotated image datasets. The system enables users to draw bounding boxes, polygons, and semantic masks over images, assign class labels, and export structured annotation data compatible with popular computer vision frameworks.

The stages of the work include: conducting an analytical review of existing annotation tools and systems; selecting appropriate technologies for frontend (Next.js, TypeScript, Tailwind CSS) and backend (ASP.NET Core, Entity Framework, MSSQL, JWT); designing the database structure for storing images, annotations, labels, and projects; implementing core functionality including user registration, project management, image upload, interactive annotation tools (bounding boxes and polygon/segmentation masks), label management, annotation export, and role-based access control; integrating with RESTful APIs; ensuring data security through JWT-based authentication; and testing the system under real-world conditions. Additionally, economic justification and energy/resource efficiency analysis were performed to assess the feasibility and sustainability of the proposed solution.

The diploma student confirms that the diploma project was completed independently. The material presented objectively reflects the state of the developed object. The explanatory note was checked using the "Antiplagiat" (<https://Antiplagiat.ru>). The percentage of text originality is 96,85%. All theoretical and methodological provisions and concepts borrowed from literary and other sources are accompanied by references to the sources indicated in the list of used sources.