PIPEVISION

PROJECT PRESENTATION

FINAL

CAPSTONE PROJECT

INNOPOLIS UNIVERSITY

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Introduction

Problem

Ease the identification of the marks of metal and pipeline components from images.

Solution

Automated, fast, and accurate recognition that enhances productivity in the pipeline construction industry.

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Roles

ANASTASIA BARABNOVA
TEAM LEAD & FRONTEND DEV

GUZEL ZAKIROVA
FRONTEND DEV

ANASTASIA SMIRNOVA
BACKEND DEV

AMIRLAN SHARIPOV
BACKEND DEV & DEVOPS ENGINEER

EGOR ZAVRAZHNOV
DATABASE & DEVOPS ENGINEER

YAKOV DEMENTYEV
CV ENGINEER

DARINA MERZAKREEVA
CV ENGINEER & TECH WRITER

RINAT MULLAKHMETOV
PRODUCT & CV MENTOR

MIKHAIL MOSCHANETSKY
CV MENTOR

MARK MARKOV
GAZSTROYPROM REPRESENTATIVE

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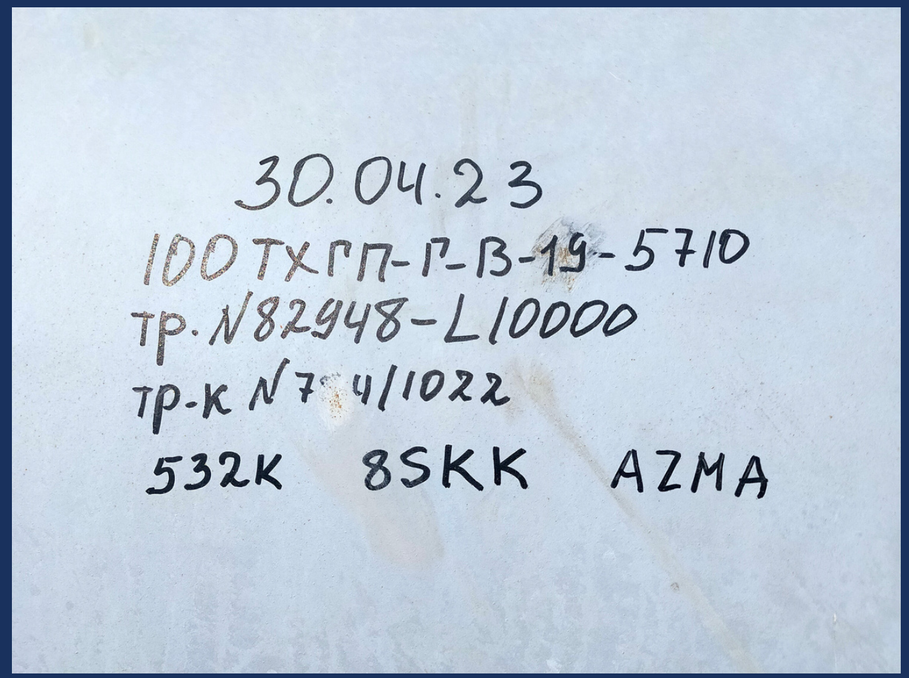
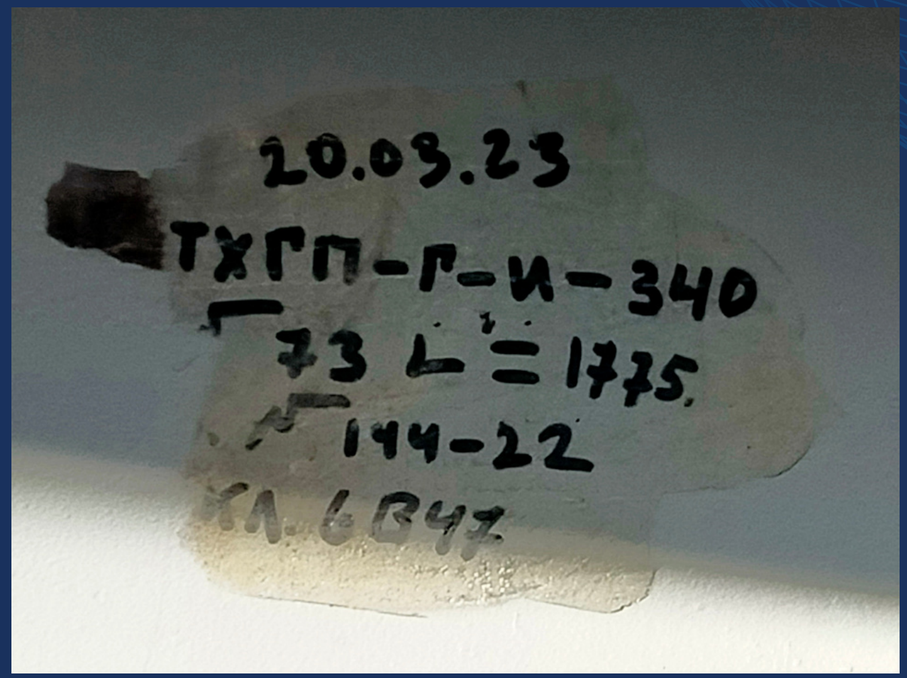
Data marking

Data Collection





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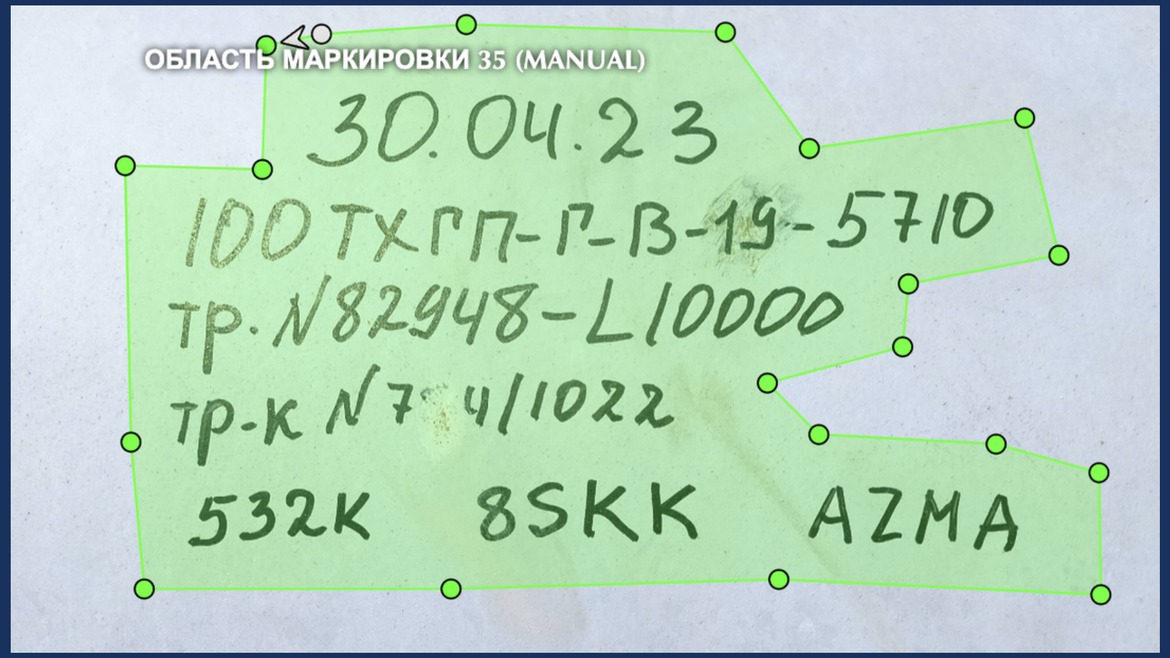
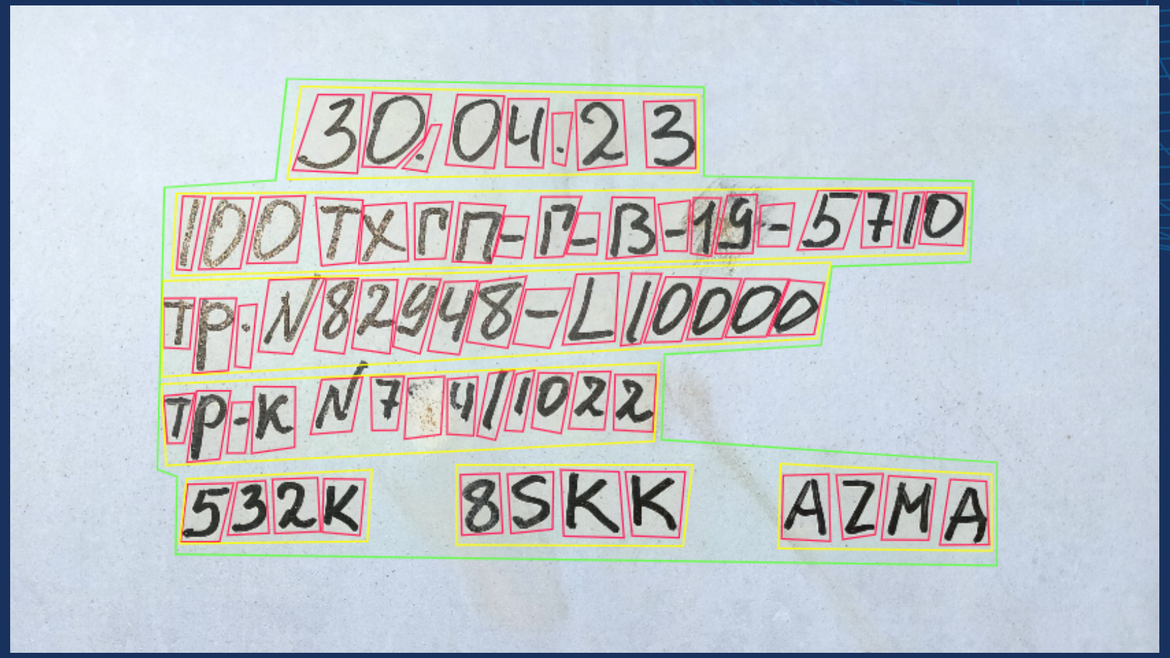
Data marking

Data markup





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Computer vision

Model

Existing CV models recognizing letters: PARSeq-SA, ABINet, TRBA, ViTSTR-S

API

The communiction with backend is made using FastAPI

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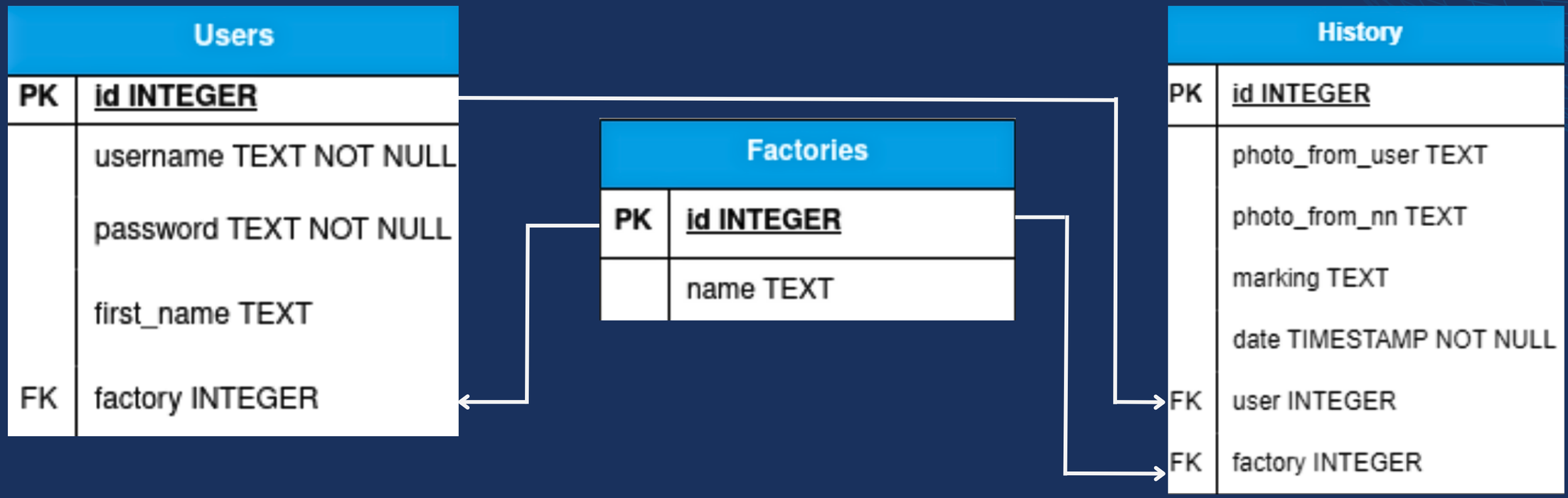
Database

Schema



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Backend Development

API

Main technology is popular framework FastAPI

ORM models and schemas

ORM models were developed using SQLAlchemy python library, schemas - with Pydantic

CRUD

Functions for creation, retrieval and update of information were developed with SQLAlchemy

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Development Operations

Hosting

Whole solution is deployed on university servers

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Development Operations

Docker

Backend, frontend, database, and the recognition engine are wrapped in docker containers

CI/CD

CI/CD pipline is made in Innopolis University`s GitLab

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Frontend Development

Design

Clickable prototype of visual interface was created with Figma

Technical Stack

Interface was developed with usage of TypeScript programming language and React framework

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Product demonstration

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Conclusion

Future Work

- Achieve higher computer vision model accuracy
- Add administration rights and functions such as abilities to create new users, assign them to factories
- Implement history expiration and open filtration for users

THANKS

For Your Attention

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