Using Machine Learning to Identify and Classify Types of Electrical Fuses

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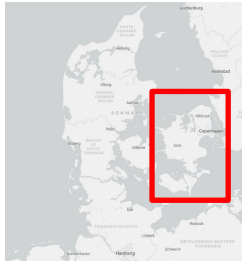
Radius

Agenda

- About Us
- Project idea
- Process of classification
- Used technologies
- Demonstration of solution
- Presenting results in ArcGIS Online applications
- Project Benefit and future goals

About Us

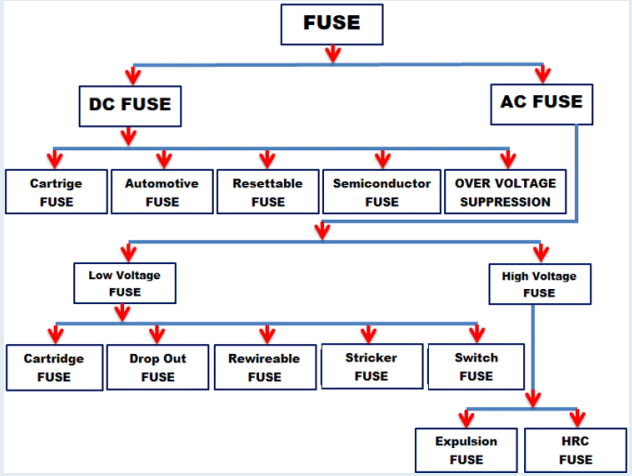
	Radius	cerius
Main Stations	92	116
30 og 50 kV km-net	719	1,048
Cable	627	178
Overhead Lines	92	870
Net Stations	10,568	10,325
Automated	506	74
10 kV km-net	6,830	9,483
0,4 kV km-net – in all	11,340	14,000
Cabinets	145,437	151,541
Customers	1,083,549	400,121

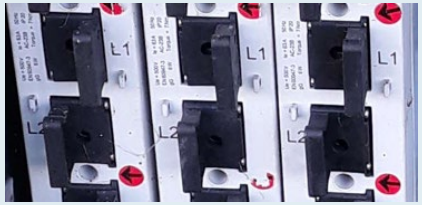


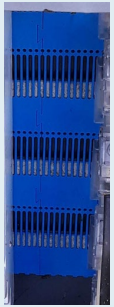
* *Information from 2019*

Project Background Information

- Low-voltage distribution cabinet
- Missing information about cabinet
- Recognition of the fuse types based on pictures of cabinets
- Empty slots

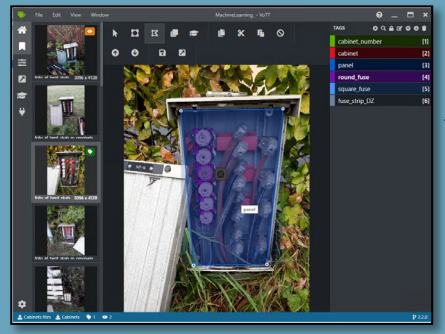




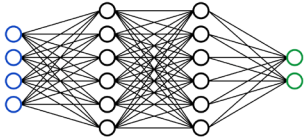


Classification of electrical fuses using machine learning

VoTT



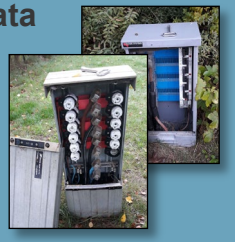
Creating objects annotations



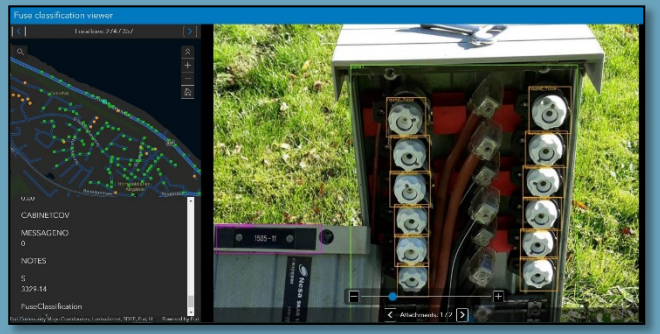
Model training

YOLOv4

Input data



Detection Using A Pre-Trained Model



Results in ArcGIS Online Applications

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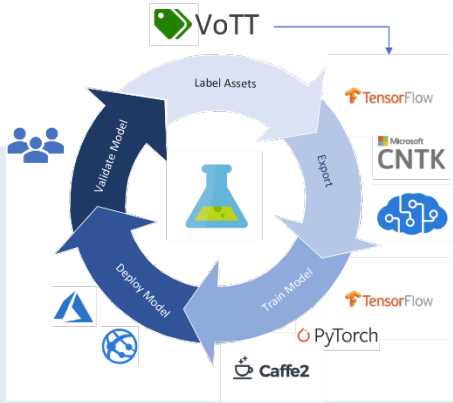
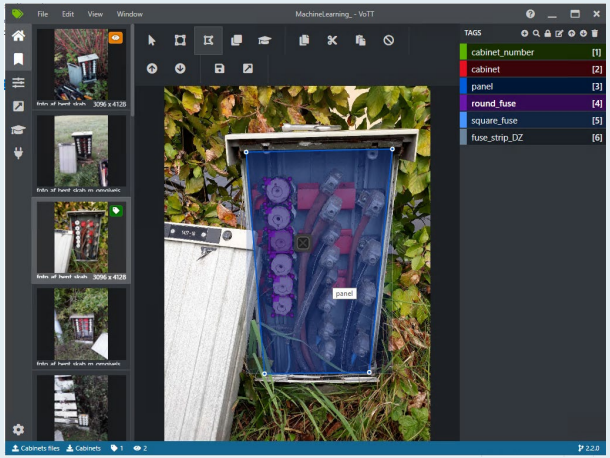
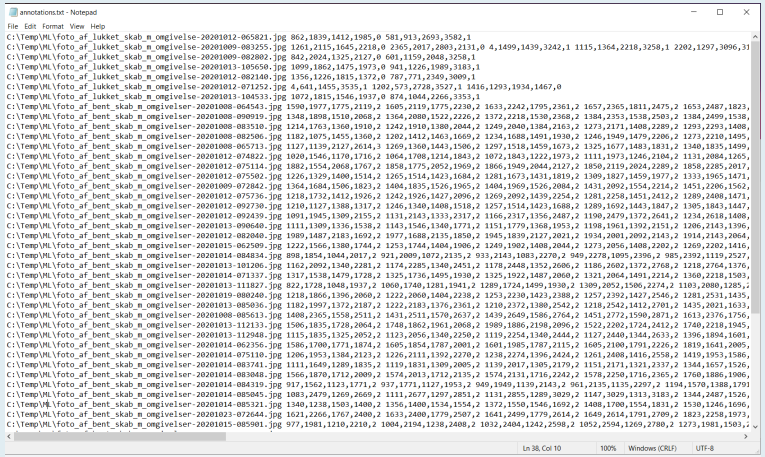
VoTT and data preparation



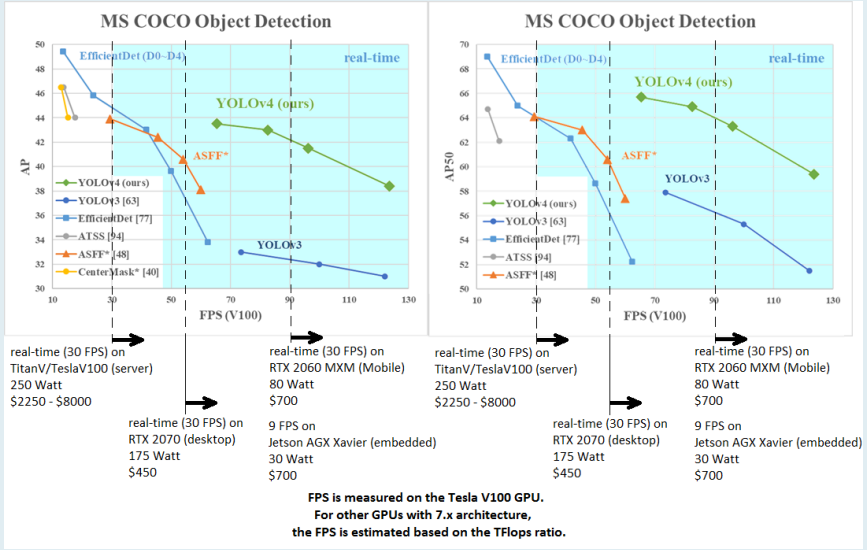
- An open-source annotation and labeling tool for image and video assets.
- GitHub - microsoft/VoTT: Visual Object Tagging Tool: An electron app for building end to end Object Detection Models from Images and Videos.
- Creating training set and test set of annotated photos in VoTT desktop application
- Exporting annotations to text files





YOLOv4 in model training

- The YOLO family of models, written in the Darknet framework
- The real-time object detection
- GitHub - roboflow-ai/pytorch-YOLOv4: Minimal PyTorch implementation of YOLOv4



Future goals

Collecting missing data based on cabinets photo, like:

- Detection of empty slots in the cabinet
- Recognizing type and state of the cabinet
- Real-time identification of the electrical devices with mobile device

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