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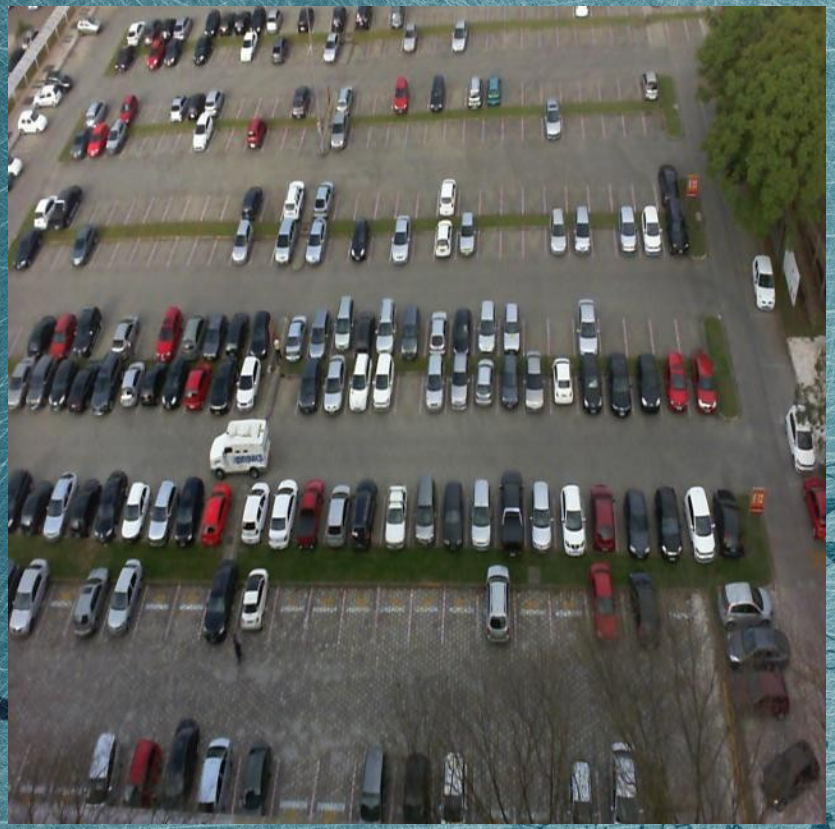
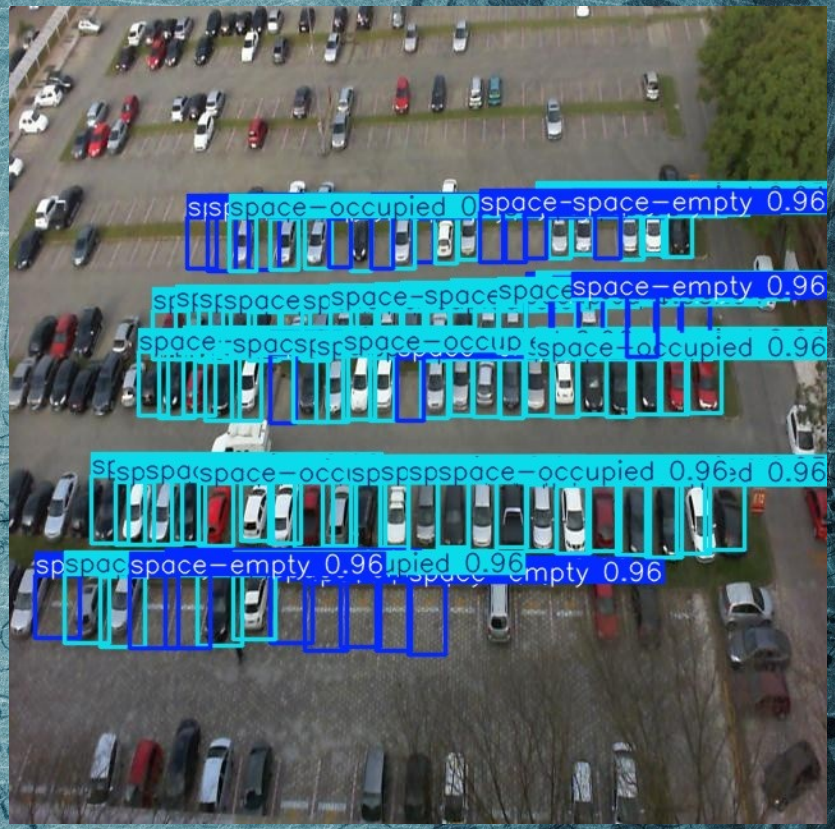
Yolov8 for parking lot occupancy





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Project input

- Project similar to the latest automatic inspection system project at work (SCHOTT AIS-XPV).
  - Multiple detections in one image possible, marked with bounding box → YOLO model
  - High speed detection of defects on glass products → YOLO v8

PKLot dataset

- https://www.kaggle.com/datasets/ammarnassanalhajali/pklot-dataset
- ~12400 pictures from surveillance cameras of the same 3 parking lots.
- Years 2012/2013, different weather, sunlight/shadows, lot occupations.
- Labeling of a selection of the lots with roboflow is included.
- Dataset is already split into train (8691), test (1242), val (2483)

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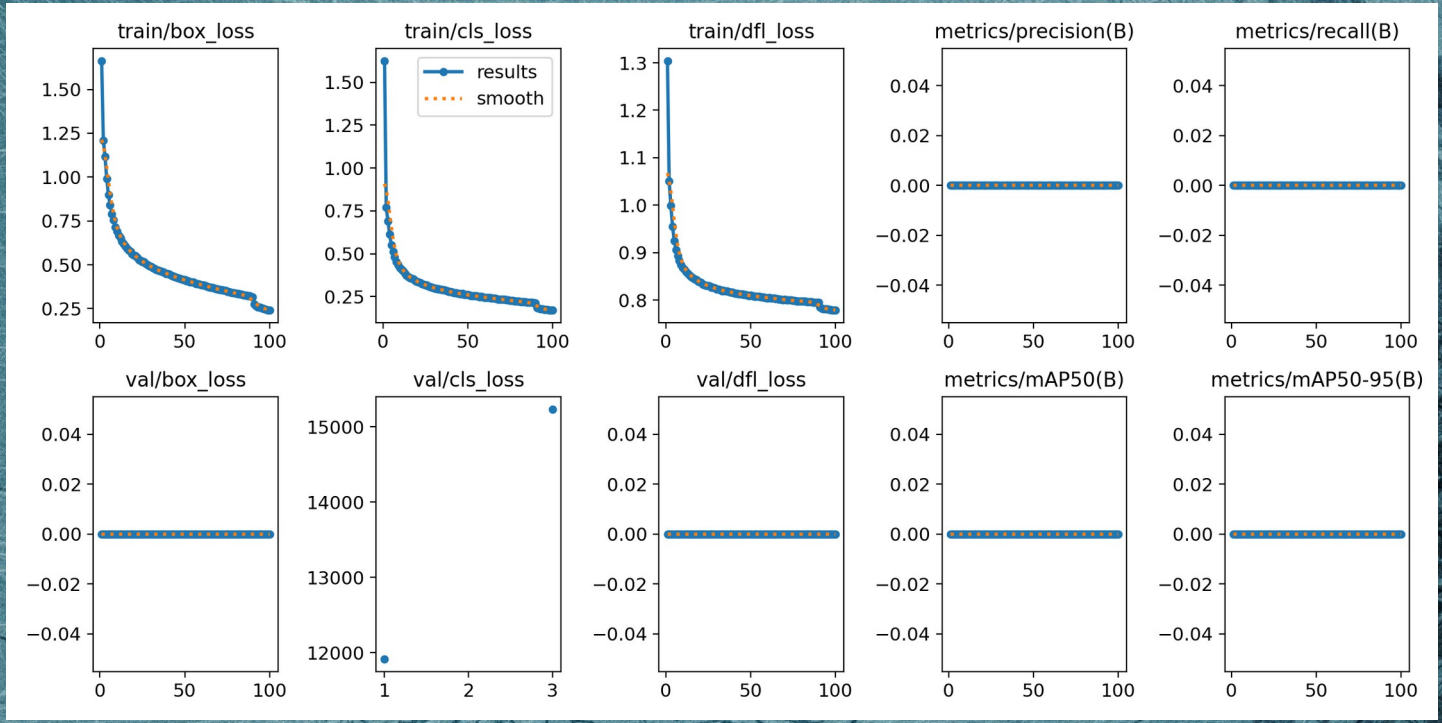
Data preparation

- Label structure from roboflow is not compatible with YOLO:
  - One large JSON file had to be processed into a *.txt label file per image, containing all bounding boxes for the image.
  - Bounding boxes are defined differently
  - Category number is defined differently
  - Additional label category file and folder structure was created manually

First successful training

- First trial with 100 epochs



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First training

- Validation labels were missing.
- Probably overfitting → 15 to 50 epochs might be enough.
- Training took about 3 hrs.

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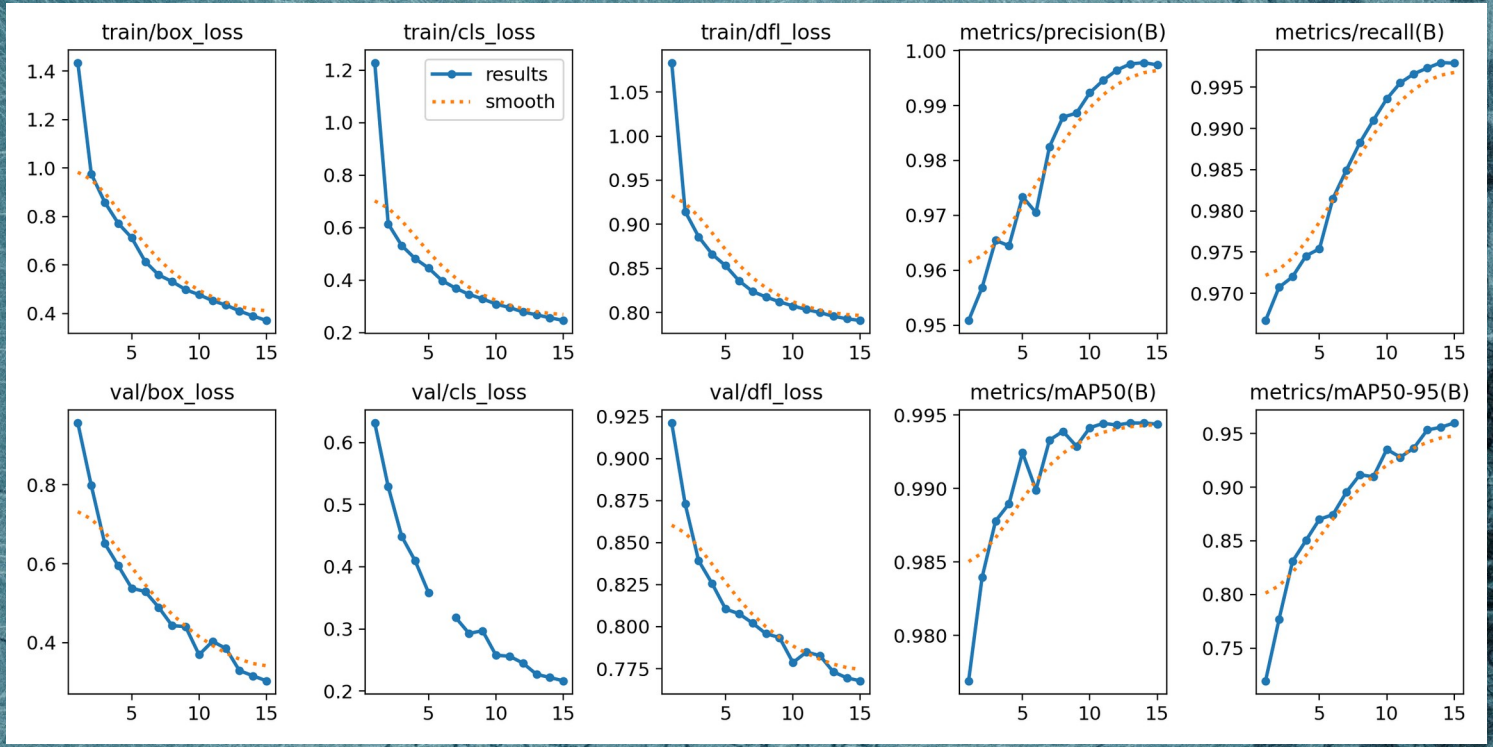
Second model

- 15 epochs



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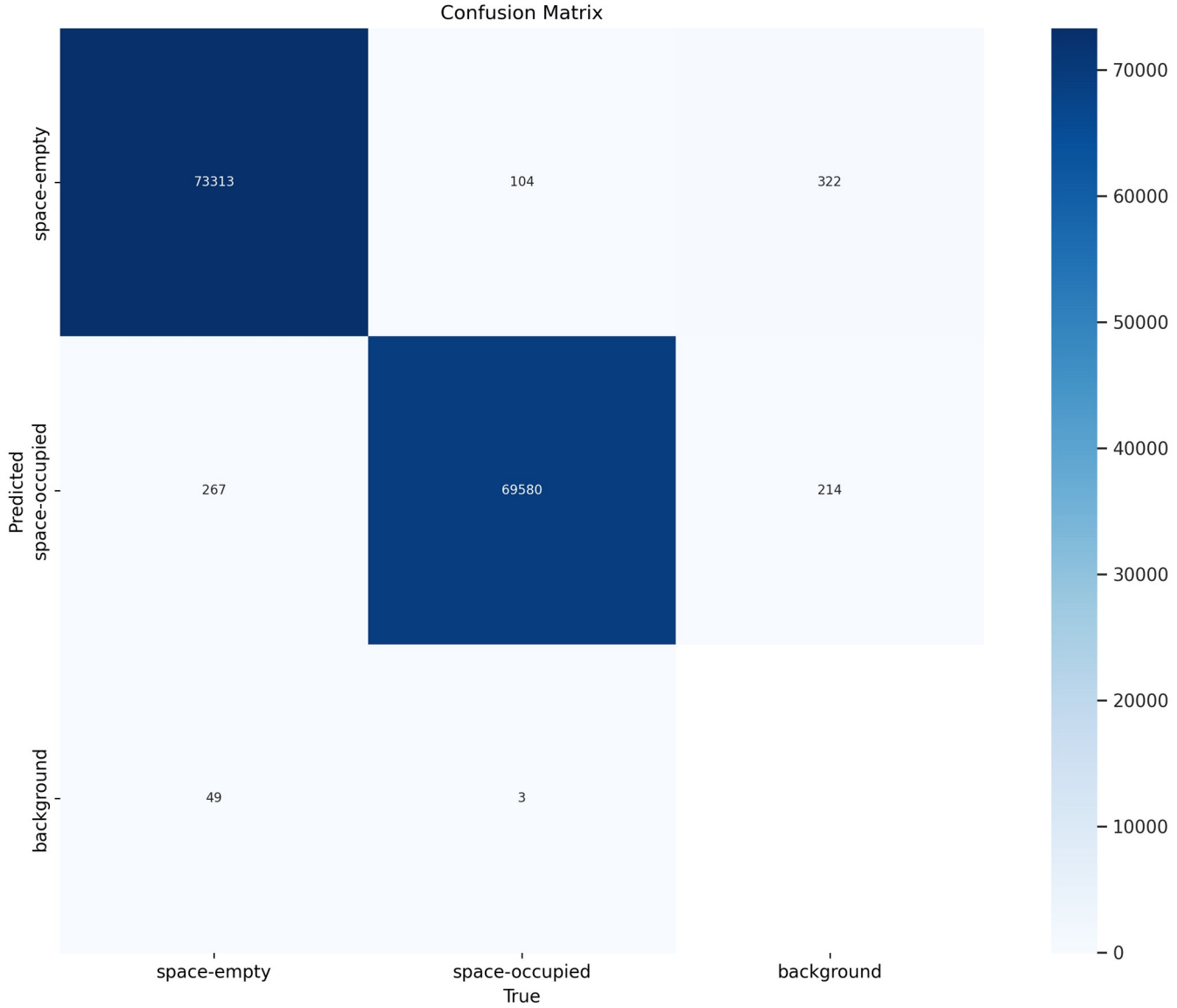

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Second model

- Many trials unsuccessful (Kernel died).
- Location of lots seem to be really strict in the model → augmentation would probably break the locality, but maybe we don´t want that (counting free lots or total cars?).

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Tipps

- With Anaconda, use new env with only ipykernel installed, then pip install ultralytics in the env.
- Only install other packages, if no up-/downgrades are necessary.
- Disable second monitor.
- Disable background processes.
- Restart before execution.
- Don´t do anything else with the computer.

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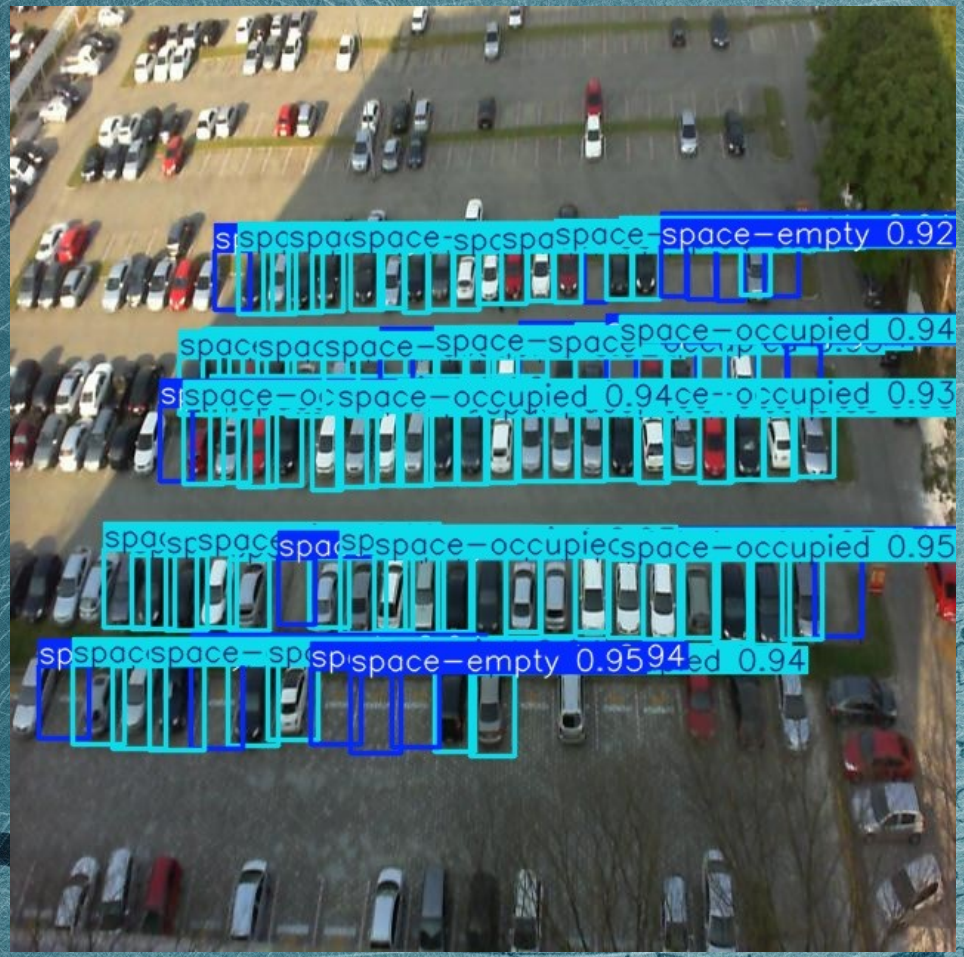

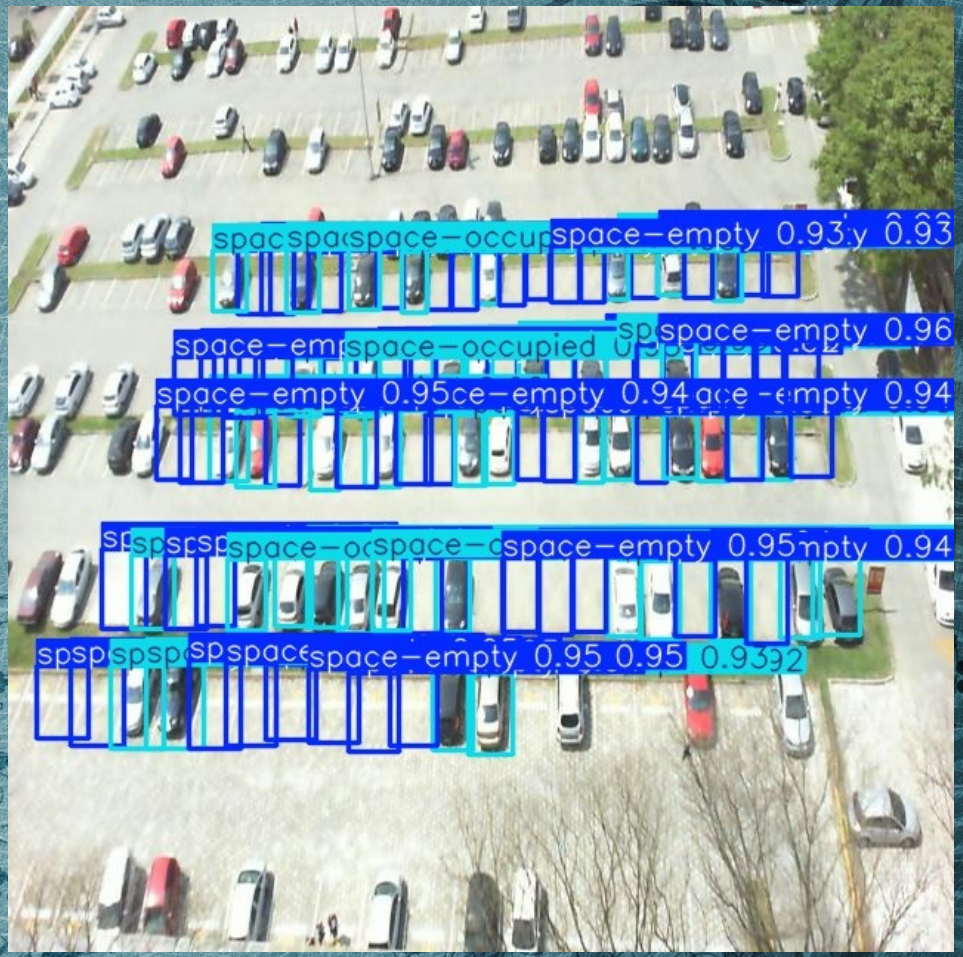

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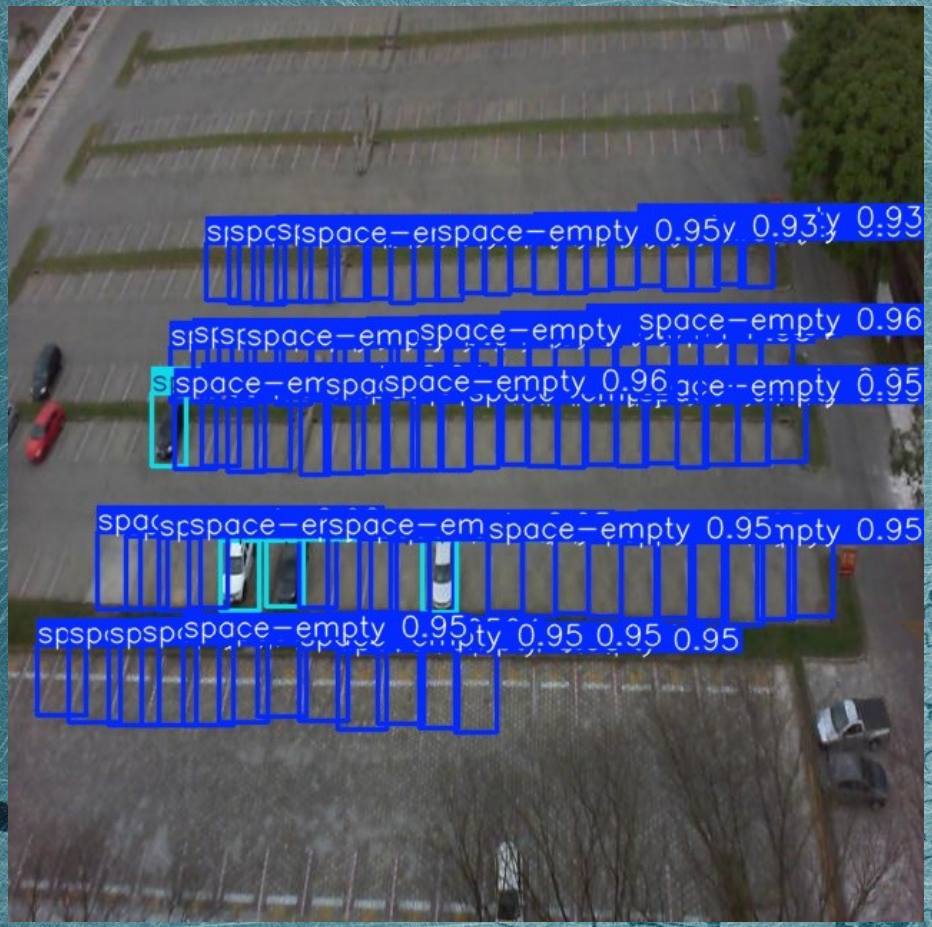

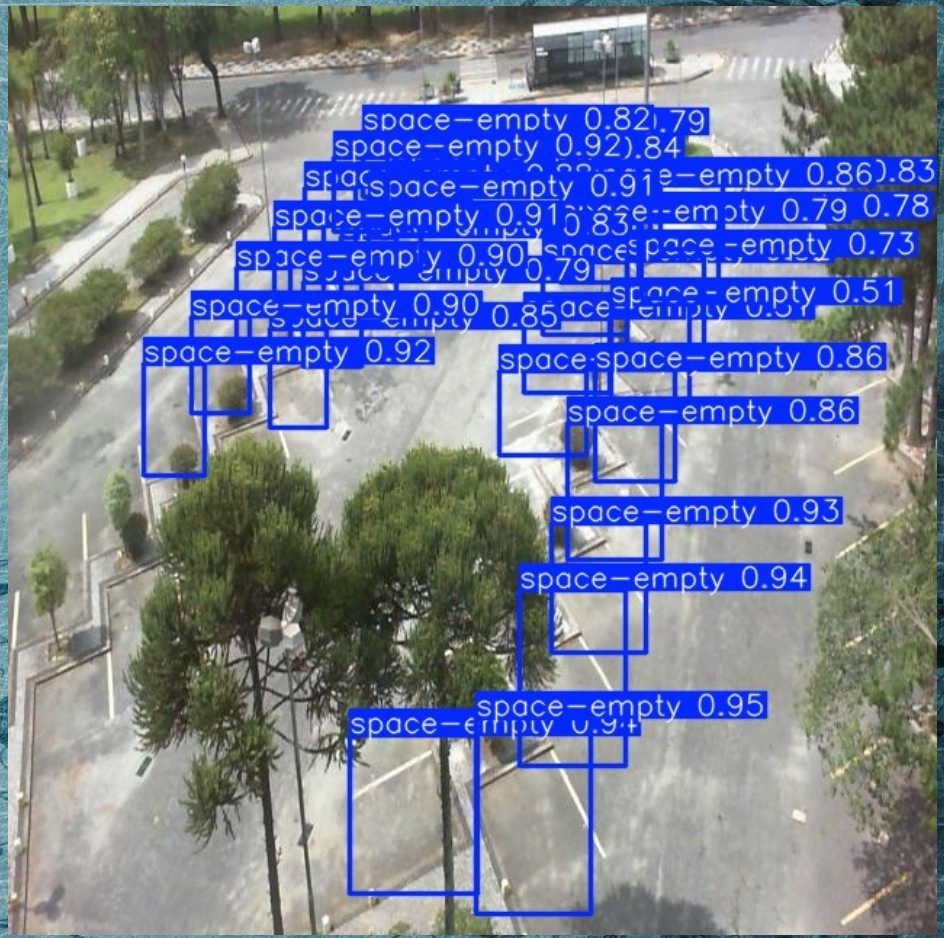

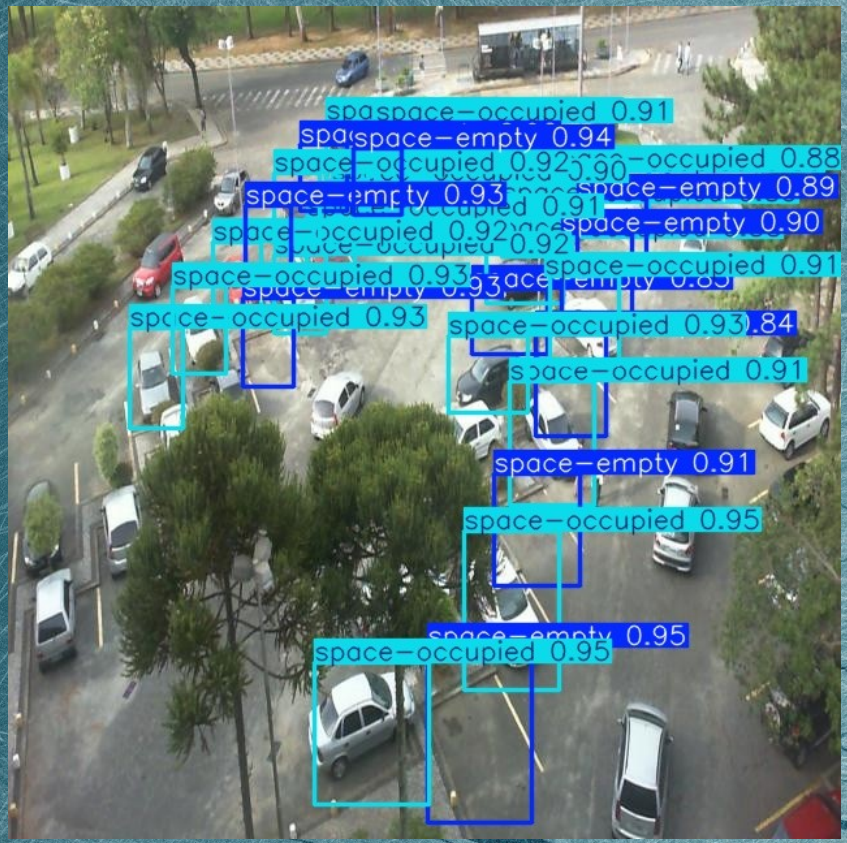
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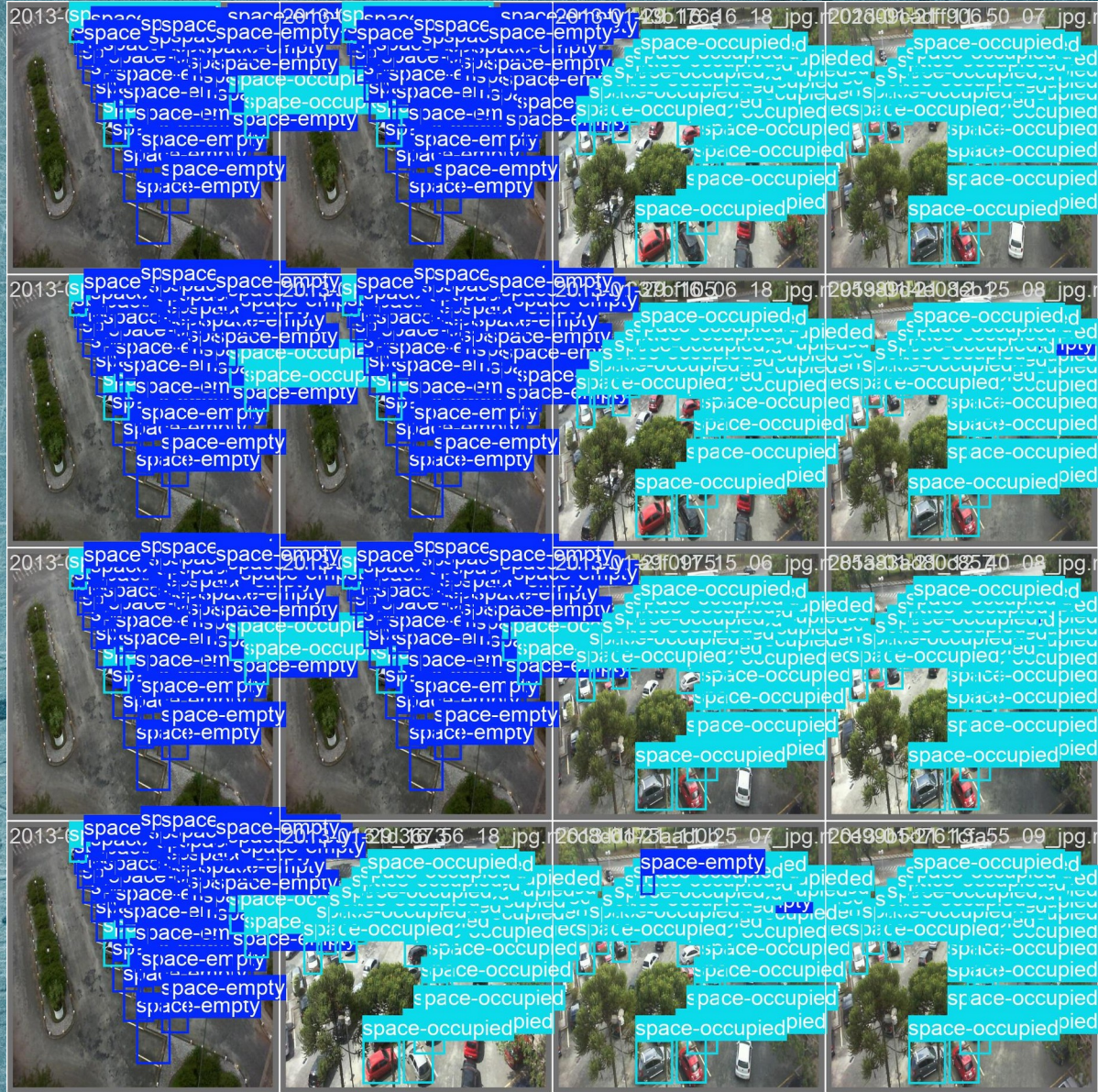
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