

# Analog Gauge Reading Using CNN Regression

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CAPTAIN'S  
EYE

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## Introduction and Abstract

- The marine environment is complex and full of hazardous potential. Using AI and computer vision.
- Captain’s Eye recognizes and prevents dangerous situations with a variety of models.
- This project extend the company’s ability adding an analog gauge reading ability

## Challenges

## Objectives

An analog gauge installed onboard a ship cannot supply training images	Use synthetic data to create train, validation and test sets
The calibration process must be easy and quick	Create a custom, specific and light UI for calibration
Model must be light and optimized	Create a custom and optimized CNN model

## Methods

### Light Custom UI

Image editing

1 image only

### Training the Model

150 epochs

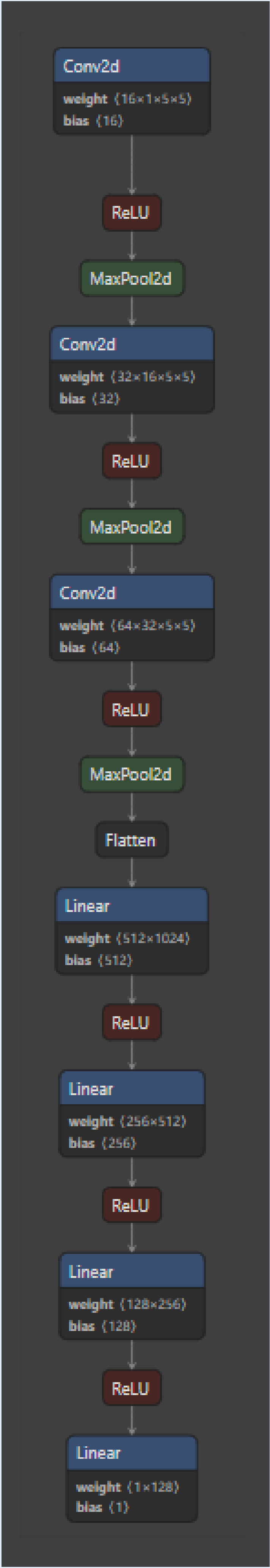
MSE Loss

Pytorch CNN  
custom  
model

### Test and Save

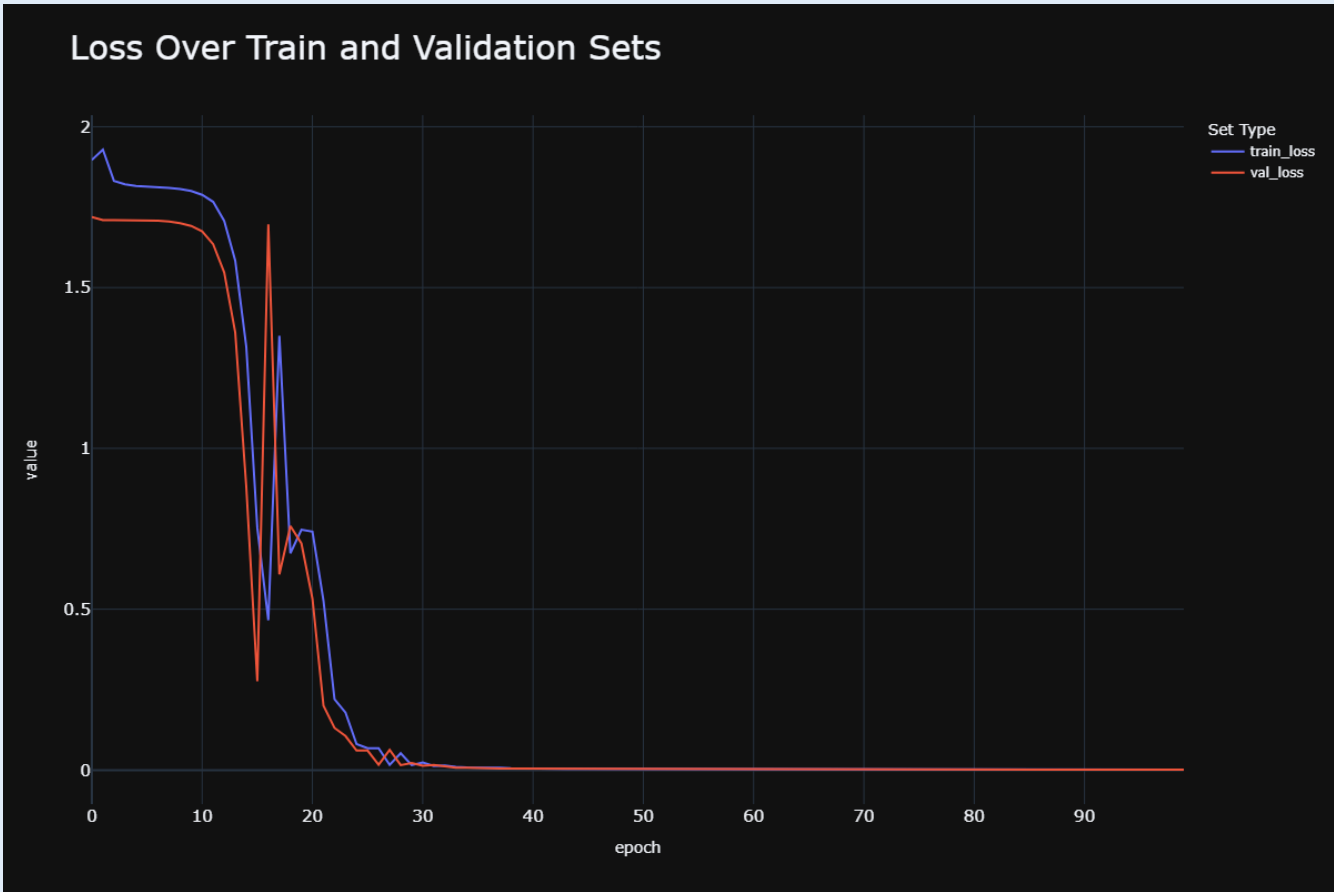
weights.pt file and XML calibration

## Architecture



## Results

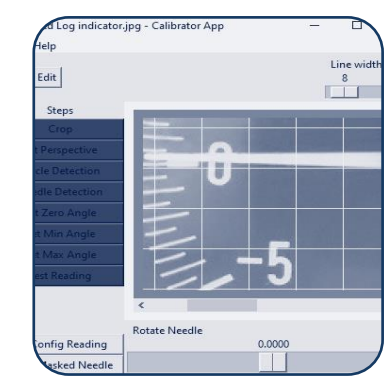
- The model trains over 100 epochs using a custom architecture built with Pytorch



## Conclusions



Reading the gauges using the synthetic data is feasible



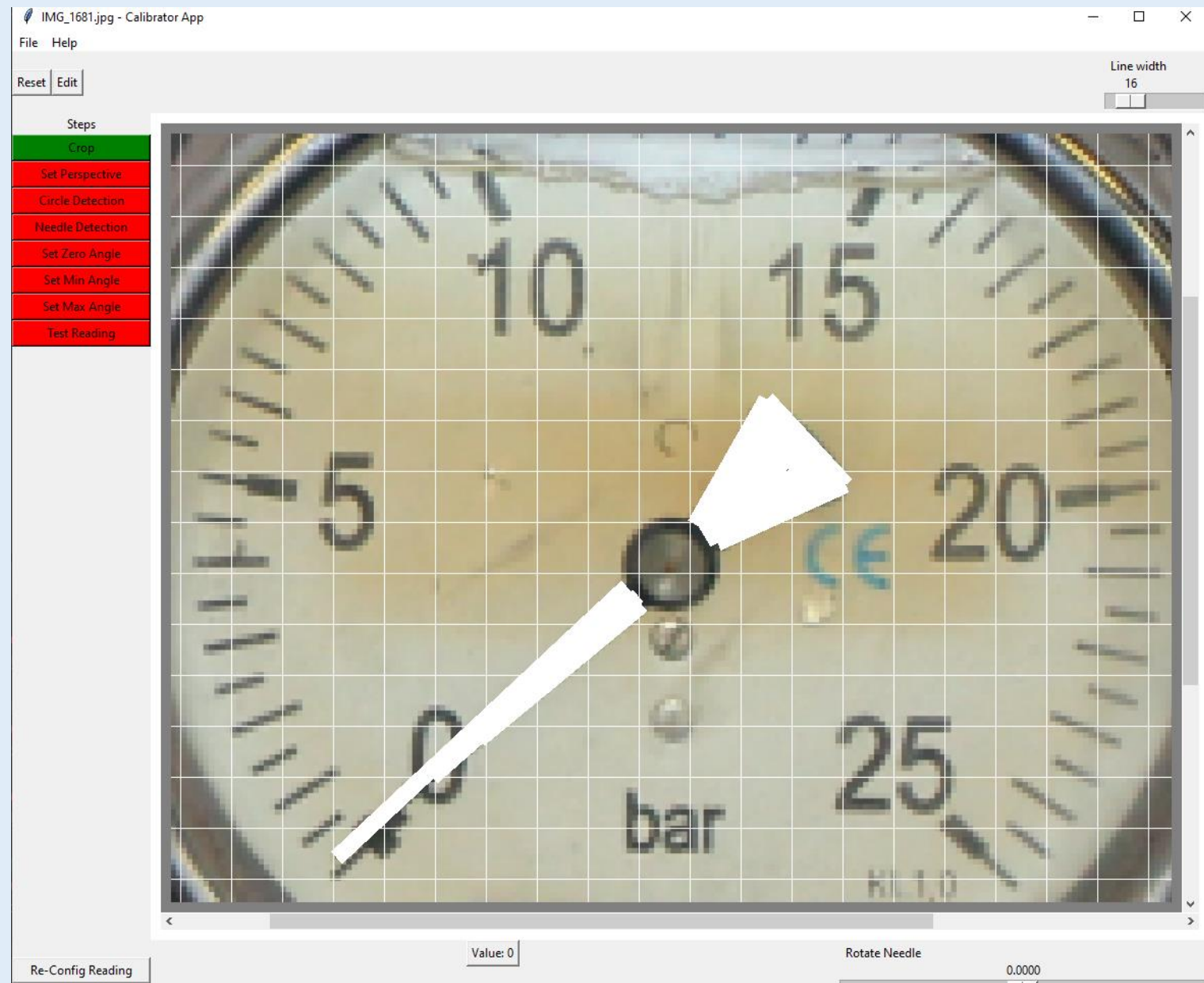
The process is light and creates a quick reading framework ready for deployment



Future improvements:  
Augmentation, digital gauges reading

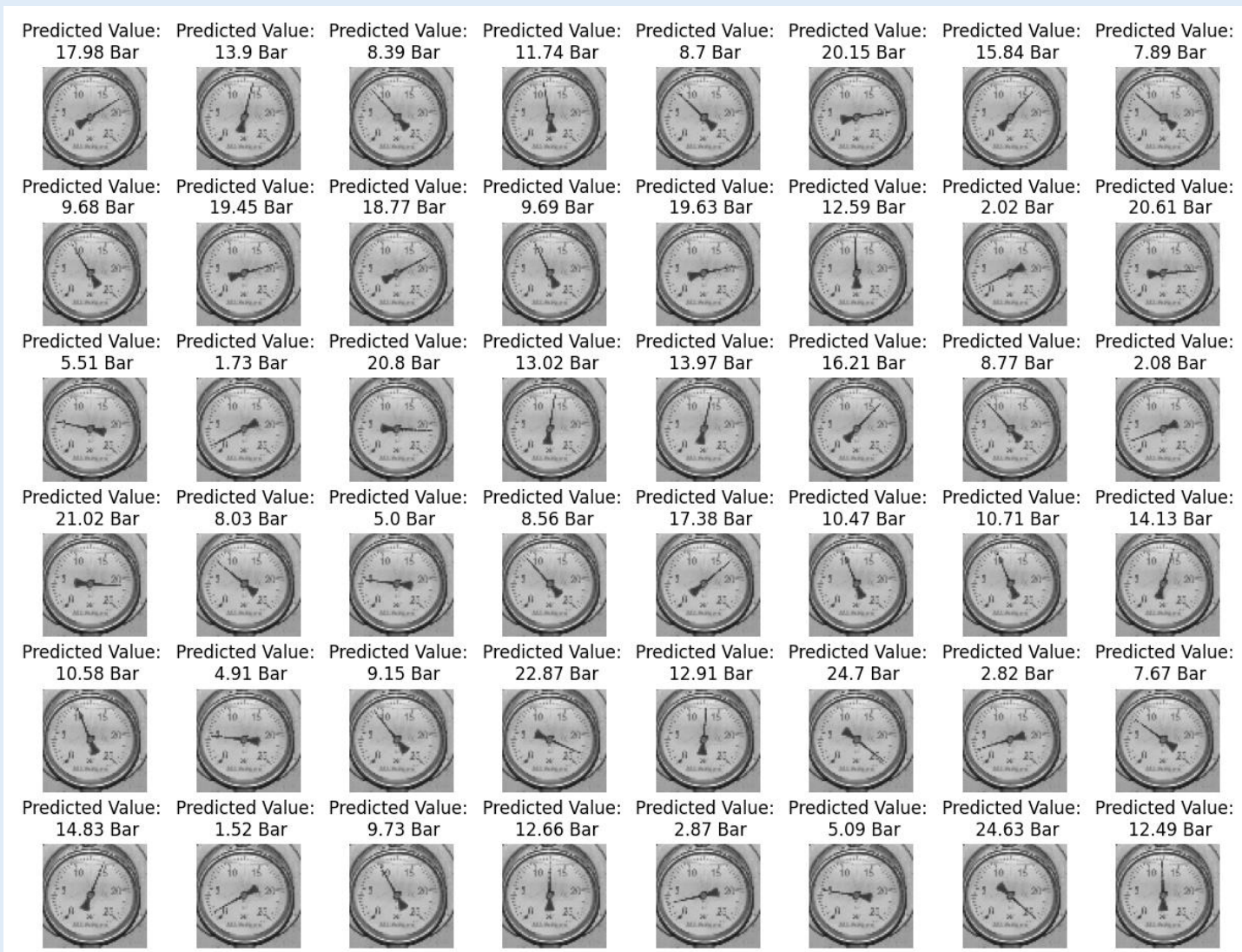
## Training And Validation

- A short calibration process includes cropping, marking the needle, fixing perspective and typing parameters
- Calibration XML is created at the end of the calibration



## Synthetic Data

- Train, Test and Validation sets - all created synthetically



## GitHub



## Demo

