

Analog Gauge Detection and Reading

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The Project

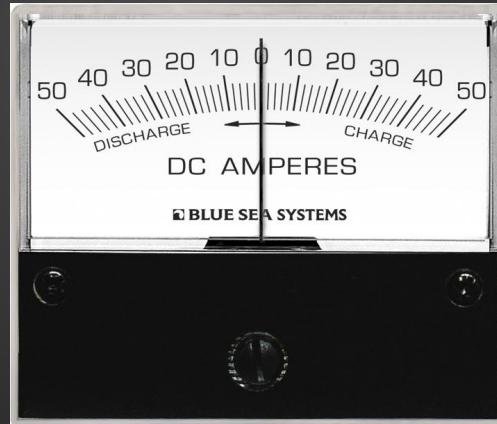
Given an image/video of a circular analog gauge, determine the reading

Determine if readings are within acceptable ranges



Past Work

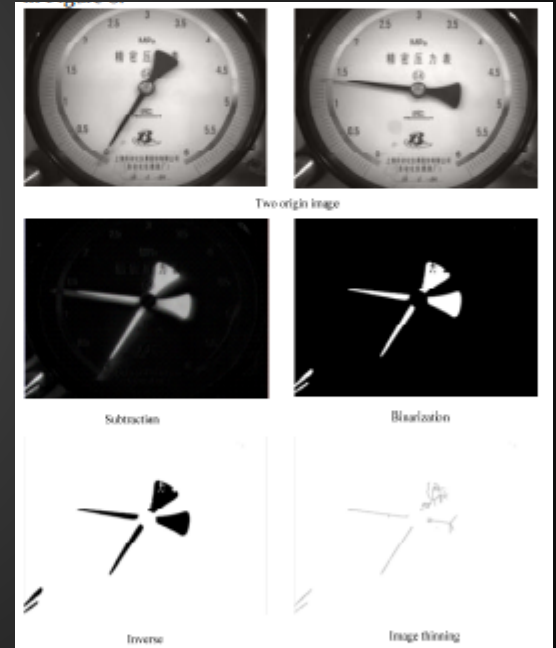
Automatic Calibration of Analog and Digital Measuring Instruments Using Computer Vision (2000)



http://shop.pkys.com/Blue-Sea-8252-Ammeter-DC-50-0-50A-wShunt_p_2318.html

Past Work

Automatic Value Identification
of Pointer-Type Pressure
Gauge Based on Machine
Vision (2013)



My Goals

Non-stationary camera

Preferably real-time

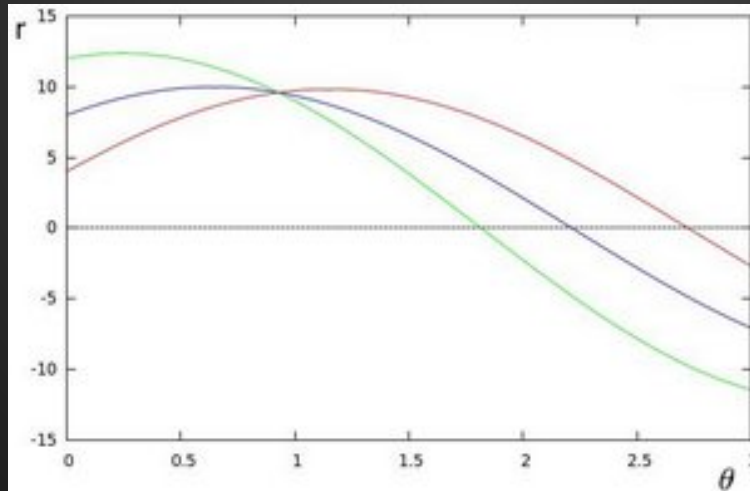
Circular gauges only

Mobile phone camera

My Approach

Hough Transforms for Lines and Circles

OpenCV: HoughLinesP, HoughCircles



Filtering

Assume largest circle in view is the gauge

Require accepted lines to be approximately a radius



<http://en.suku.de/assets/products/1105/original/4351fkl.jpg?1272026106>

Real Data

[https://drive.google.com/open?
id=0Bzc_2CWoZDqAc0s5ZIRvZEFqR0E&auth
user=0](https://drive.google.com/open?id=0Bzc_2CWoZDqAc0s5ZIRvZEFqR0E&authuser=0)

angle: -122.957549



angle: -123.000000



angle: -123.890288



angle: -125.000000



angle: -127.330189



angle: -125.000000



angle: -125.000000



angle: -125.000000



Future Work

Match gauges to a database of feature descriptors (ORB) (for gauge identification)

Sequential images of same gauge (flow rate)

Digit Identification?

Android OpenCV (NDK if performance dictates)

Questions?