

Table of Contents

Tracker Phase 2 upgrade, IIHE(ULB/VUB) Metrology Working Group.....	1
Tasks.....	1
Software.....	2
Meeting minutes.....	2
Contact.....	3

Tracker Phase 2 upgrade, IIHE(ULB/VUB) Metrology Working Group

Scope:

* Development of an automated metrology setup that can:

- measure the sensor mask to edge distance for single sensors.
- measure the corner to corner distance between upper and lower sensors.
- help with general purpose metrology

Meeting slot: (tentatively) Tuesday 13:00.

Given that there is a large overlap between software developments for Pattern Recognition WG and the Metrology WG, collaboration is expected. The Twiki for the Pattern Recognition WG can be found here: <https://twiki.cern.ch/twiki/bin/view/Main/IIHEPatternRecognitionWG>

Meeting room: <https://vidyoportal.cern.ch/join/AxbFexLaqJ>

<https://cern.zoom.us/j/6200434616?pwd=Z0ZzRnRjTjAvZEpuUFJ6RHEvVWNRZz09>

An overview of the metrology setup can be found in this presentation:

https://indico.cern.ch/event/890601/contributions/3756093/attachments/1991001/3319418/metrology_overview.pdf

Tasks

Assigned to	Due date	Description	State	Closed	Notify
EmilSorensenBols, AnnemariePaulMorel		Track the delivery of the ordered equipment			edit
EmilSorensenBols, AnnemariePaulMorel		Setup the equipment			edit
EmilSorensenBols, AnnemariePaulMorel		Build a holder for the camera and lens			edit
EmilSorensenBols, AlexanderMorton		Optimization of the base edge detection algorithm			edit
Main.?		Make line filtering algorithm more robust for more use cases			edit
Main.?		Make the function that calculates distances between edges more flexible			edit
Main.?		Add pattern recognition algorithm to detect alignment marks			edit
Main.?		Optimize algorithm that stops the z-stage when corner is in focus			edit
AlexanderMorton		Add corner detection algorithm			edit
Main.?		Integrate the xyz-stages with the pattern recognition setup			edit
Main.?		Integrate the measurement outputs with the database framework			edit

Software

We are using this github repository to coordinate our software developments:

<https://github.com/emilbols/PatternReco>

Our test images and videos can be found in this CERNBOX directory.

<https://cernbox.cern.ch/index.php/s/prUdL1yAzN01BFj>

Meeting minutes

12th May:

slides: <https://indico.cern.ch/event/912951/#19-metrology>

The xyz stage system, the telecentric lens and the LED lighting has arrived. We will have to test it to make sure none of the equipment is defective. Will be done next week. Furthermore most of the metrology system can already be set up, which should be done in may. Emil will draft a schedule for days where it will be needed to go to IIHE, which he will share with Jorgen. The company delivering the camera, are experiencing delays, and the arrival has been pushed to the start of june. A windows computer will be needed for the setup. Emil will find the main technical requirements and share them with Jorgen. Annemie points out that there currently is a windows laptop in the cleanroom which can probably be used for first tests of the XYZ system.

On software side, Alexander expressed that he had managed to setup the OpenCV framework on his system, and he was having first look to immerse himself in the code. Emil and Alexander discussed the first steps in terms of the software development, which would be to make a python class for hough line manipulation, as well as making a more robust line to line distance calculation function. Finally a function to identify corners in the images, would be an essential first task.

19th May:

slides: <https://indico.cern.ch/event/912952/#19-metrology>

On procurement side Emil inspected the delivered equipment. The telecentric lens looked to be in perfect condition and the coaxial illumination is working well. The xyz system was also inspected. We recieved an additional stage and positioning system that we did not order. We are also missing one cable to interface with one of the linear stages. It also seems cables for combining the position controllers were not included. These missing cables should not be a bottleneck for doing first measurements on a dummy module. Emil is corresponding with the company. The xyz stages are to be tested as soon as we have a windows laptop from IT.

On software side Alexander started working on a class for processing fitted hough lines extracted from the edge image. He also implemented a function that detects overlapping lines, and mark these as corners. First iteration is detecting quite a bit of fake corners. Emil suggested to put in a requirement that the intersecting lines should be orthogonal, as we are mainly interested in detecting the corners of the modules, which are right angled. Alexander mentioned he will open a pull request to the github repository in the coming days.

26th May (no meeting, short summary of progress):

On software side, Alexander implemented into the pattern recognition software a corner detection algorithm,

some more class functionality in the repository, as well as some additional preprocessing of images to optimize the edge finding. I am also currently looking at making things more modular, so it is easier to use for different tasks such as kapton gluing, as well as metrology. For the software of the stages, they came with a python module that can be used for interfacing with the stages, so it should be relatively straightforward to plug it in to our software framework. Next steps is adding some additional noise removal in the image recognition software, and then really write the code connecting the stages with the image recognition, so really converting the relative coordinates from the images with the absolute coordinates of the stages.

On procurement side, we have mostly everything, we are only still missing the camera, as well as some motor cables, both set to be delivered next week. We also shipped back some additional equipment we were sent by Te Lintelo by accident. I set up the computer we will be using in the cleanroom. Annemie is looking at solutions for holding the USB microscope, we have a clamp in Annemies office, which can be used at first, but in the long term something more robust is needed.

Contact

Group convener: Emil (emil.bols@cernNOSPAMPLEASE.ch)

-- EmilSorensenBols - 2020-04-29

This topic: Main > IIHEMetrologyWG

Topic revision: r8 - 2020-05-28 - EmilSorensenBols



Copyright &© 2008-2022 by the contributing authors. All material on this collaboration platform is the property of the contributing authors.

or Ideas, requests, problems regarding TWiki? use Discourse or Send feedback