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Individual Report (Weekly Updates + Contribution + Retrospective)

Purpose

This document is to elaborate on how I contributed to this project as well as my thoughts and feelings about doing it.

1. Contribution

My contribution to this project is on 2 areas: project management and software delivery.

Project management:

At the very beginning, I have volunteered to be the project manager within my team and after consensus by all, I was so for about a month. My aim was to be the best team in terms of management as I was set to introduce industry standards of IT project management. During my short period as project manager, I have implemented a Scrum methodology and made use of Taiga.io for this purpose ***(see below section "Extras")***. I have also elaborated an on-boarding document ***(see "SE3D Onboarding.pdf")*** to serve as a guide for the team to start up on the project by getting the tools of interest installed. I have run regular meetings online with Skype Enterprise which is used by many companies for efficient team work ***(see below section "Extras")***. For each meeting I have run, I will set reminders (though Outlook and Facebook) and document the points and ideas discussed ***(see "Meetings Log.pdf")***. Also, I have delivered few knowledge sharing sessions both technical and managerial ***(see below section "Extras")***. Finally, I have contributed to the final report by writing the technical section ***(see section "Technical Implementation Walkthrough" of the final report)*** with no "copy-paste".

Software delivery:

Firstly, the environment set up was a burden to most people due to very poor installation guidelines from previous projects. I have therefore come out with a comprehensive and step-by-step installation guide tested on a fresh Windows 10 environment that will make it much easier for future students. I have made full length screen-recorded videos which will be incrementally uploaded on YouTube ***(see https://www.youtube.com/channel/UCmaisx4hi_aZYlV6xIY1eJw)***. Secondly, as part of the initial technical work partition done within the team, I was tasked to pick up and handle OpenCV. I was therefore taking some time to get deeper on OpenCV to acquire strong fundamentals of it and be able to effectively use it for the project. I wanted to come out with, among others, a module dedicated to custom Kinect calibration but I later had to break from OpenCV to start learning about PCL as the team faced reasonable difficulties with it and therefore it needed new ownership. This was unfortunately done in a very short period and late stage, but I could manage to wire up things and come out with all the different modules of the software. Additionally, I have used CMake as the build management tool

for our project. However, for the GUI, I could not find time to do it as I was busy with the core coding from end-to-end and prioritized to spend more time to make it OOP friendly instead of doing the GUI.

2. Retrospective

For me, this project was very interesting as it exposed me to a new theoretical topic evolving about 3D registration. I would hear about and see people using the Kinect for playing video games but little had I known about the mysteries it inboxes or the way it works or can be employed to do cool things such as 3D scanning. I also discovered the world of lenses from studying calibration. I appreciated how some of the concepts I have studied in other courses such as Linear Algebra and Image Processing revealed to be very much relevant. I have used previously different frameworks and libraries in Java and JavaScript (Spring MVC, Hibernate, AngularJS, Cordova, etc.) but this was the first time I make use of C++ external libraries or interfaces such as Boost, OpenCV and PCL. It was not an easy task at first and the learning curve was rather steep initially but soon I started to get the hang of it and could pick up the skill. Also, I have to admit that I did not give proper and enough time to tackle this project. This was due to my heavy load schedule during the whole semester. In fact, I struggled a lot with the courses as the last time I attended a class/studied was back in 2014. Rarely I would understand much from the lectures and it would take me several hours of self-study to cover an hour of lectures. This is in addition to the multiple homeworks which I would give priority as they were the earliest in terms of deadline. So basically, the only period I could really start putting my focus on this project was after the final exam week and I can estimate it would have been enough for me to deliver a very decent software but unfortunately, I ended up with other courses' projects which similarly I couldn't progress extensively during the lectures and examination periods. So, I can say that I've put on my sweat for a couple of days only, unfortunately. This being said, I wished we could have been given until the far end of the semester, so I would have been able to refine, improve and optimize the software.

3. Weekly Update

Report 1 – 27/11/2017

I have delivered 2 knowledge sharing session: "Agile development with Scrum" and "GitHub for team work".

I have set up my PC with tools and configuration to compile and run the projects.

I have made recordings of the full step-by-step to achieve that as many faced issues on this part.

Also, I have started ramping up on Qt GUI apps and PCL.

Report 2 – 04/12/2017

I have ramped up my knowledge on OpenCV and CMake. I will take the initiative to implement them for the project.

I will dive more on OpenCV to acquire the relevant knowledge for improving registration of data and feature matching.

I will prepare a demo session to introduce and familiarize the team with OpenCV and CMake.

Report 3 – 11/12/2017

I have started looking at camera calibration using OpenCV.

Report 4 – 18/12/2017

I am still on calibration with OpenCV. The progress has been slow on my side as the past week was busy with assignments and revision for the exams.

Report 5 – 25/12/2017

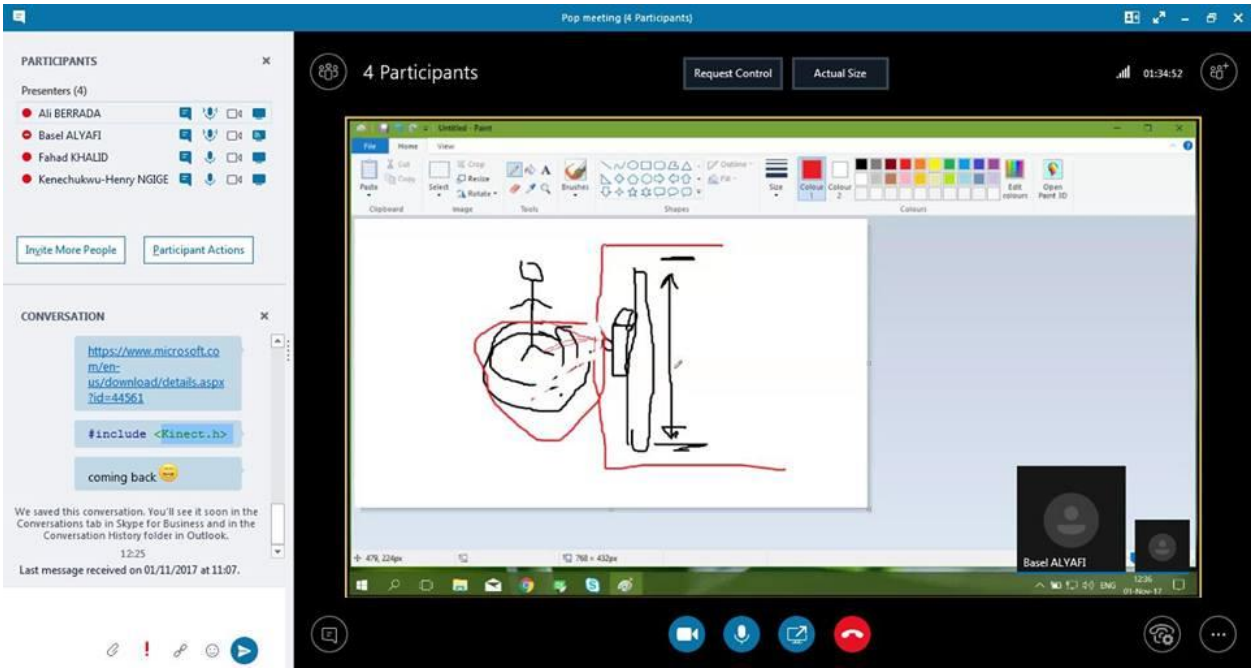
After some struggle, I have managed to compile and build OpenCV 3 with contrib modules (to enable extra features like feature detection). I am now testing the feature detection module.

Report 6 – 01/01/2018

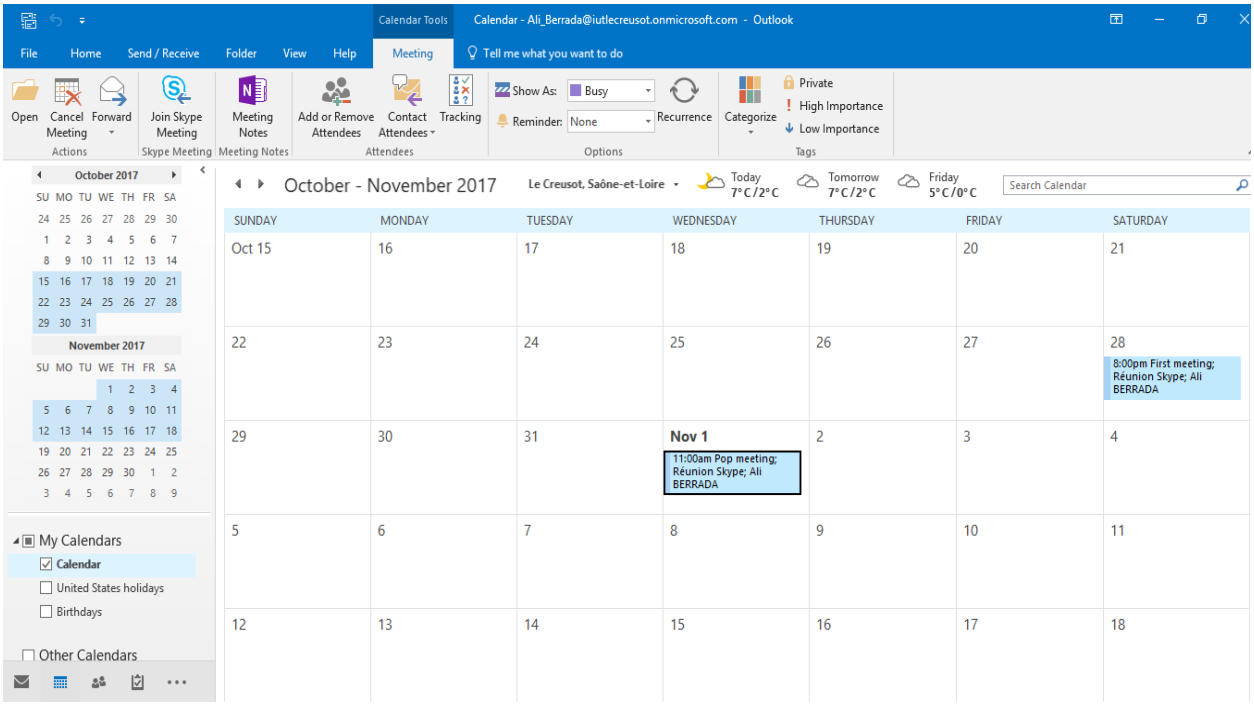
As there were some difficulties to pick up the PCL library by other team members (while I set my focus on OpenCV) I had to spend some time to ramp up on PCL as well as acquiring data with the Kinect.

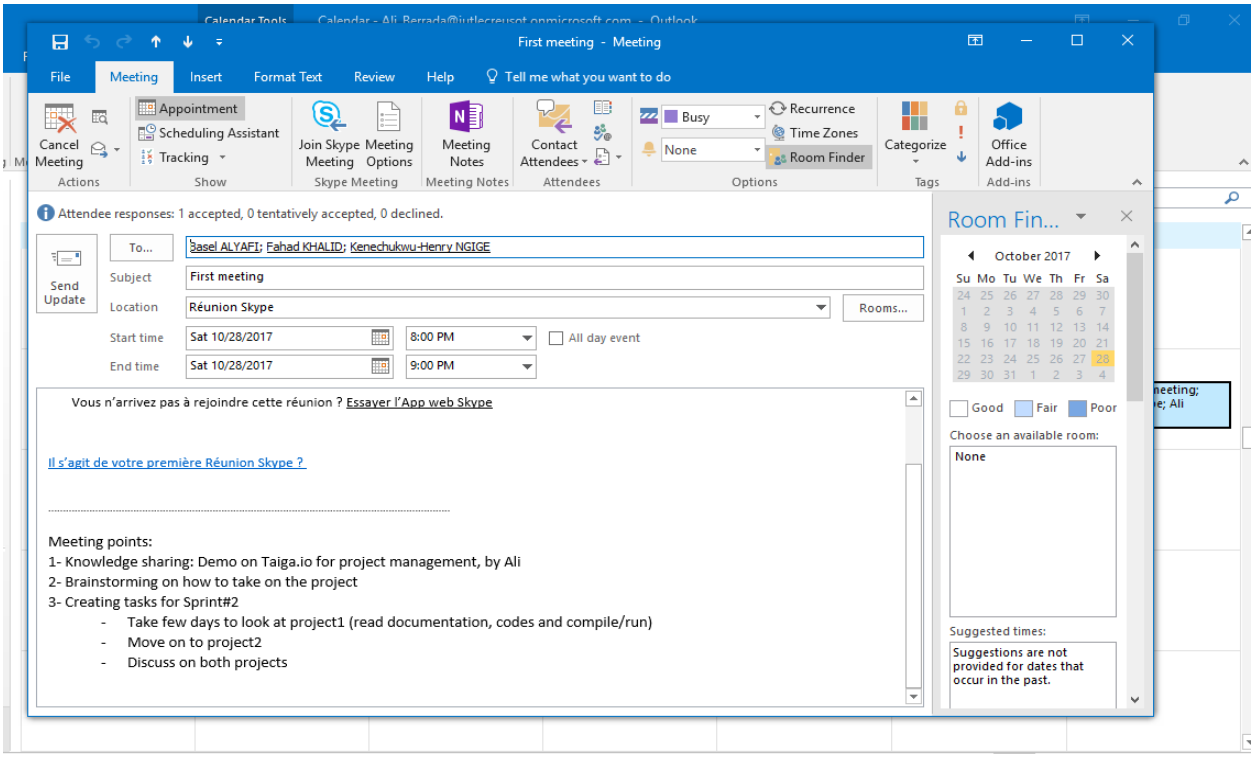
Extras

Conducting constructive online meetings with Skype Enterprise

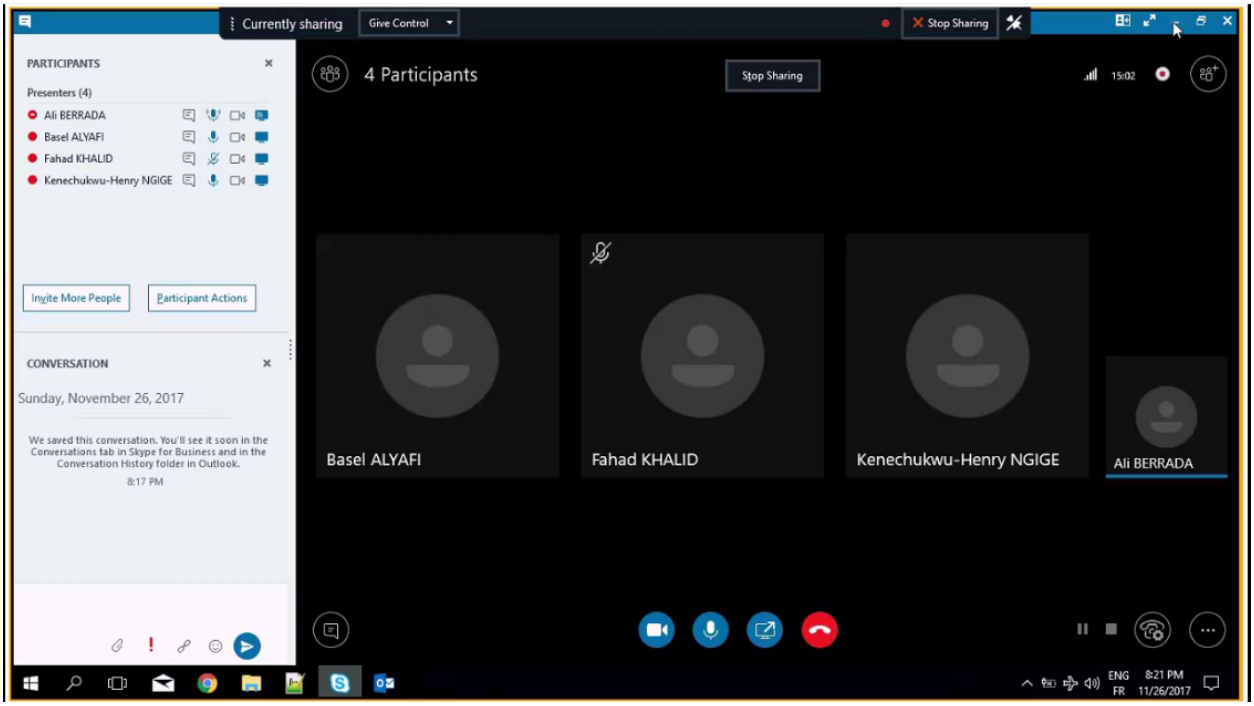


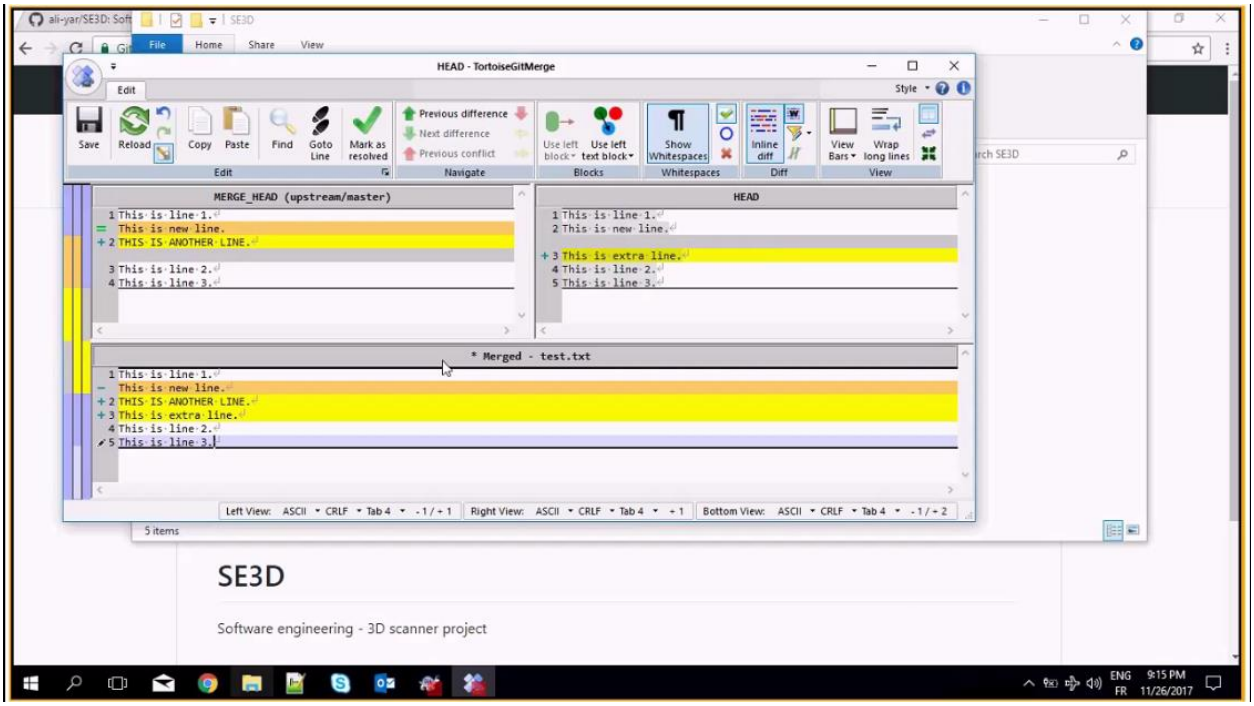
Scheduling meetings with Outlook



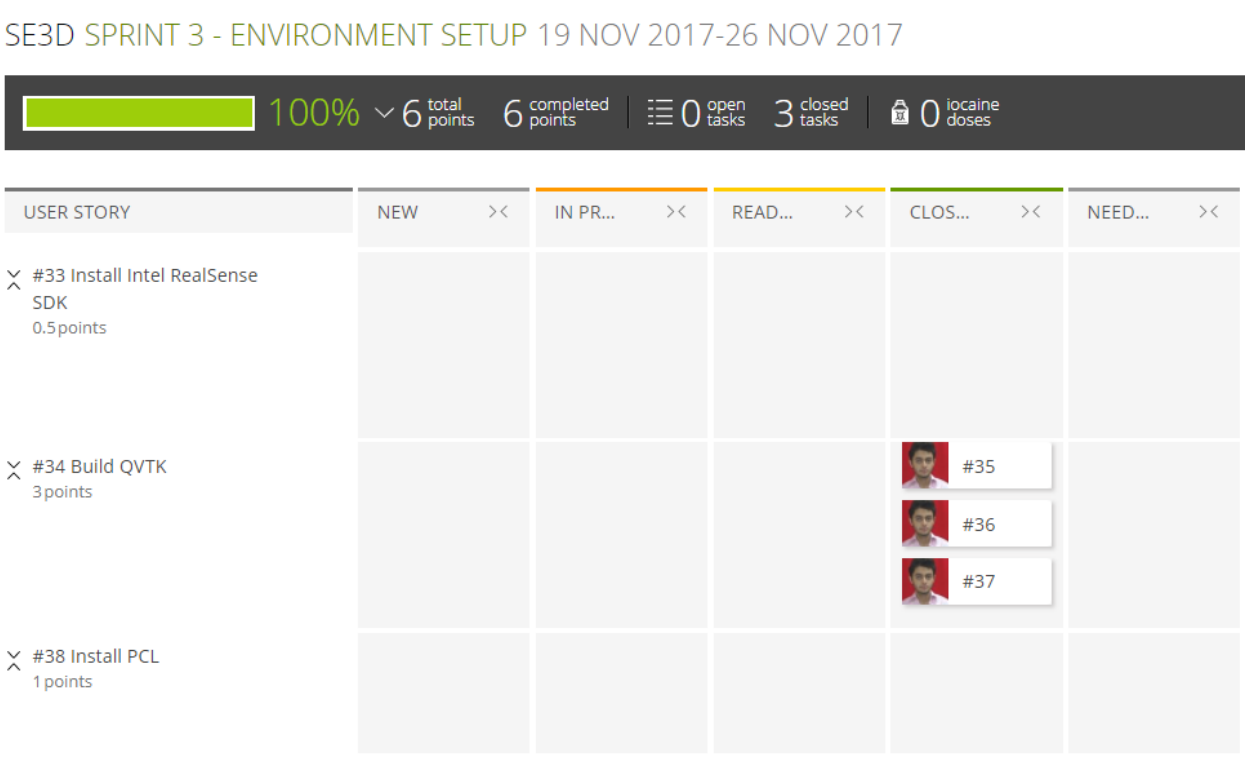


Delivering knowledge sharing sessions to the team





Running in SCRUM mode with Taiga.io



Full recording from environment setup until successful project compilation and run (including all tricks and bug fixes)