Personal Development Document

Thomas Schenk

# Persona

My name is Thomas Schenk and I am 21 years old. Originally, I am not from Brabant, but from Hilversum. Luckily, I moved a bit down to Utrecht; so the commute is (somewhat) doable!

Aside from my interest in Technology and software, often times I am found in the garage working on vintage motorcycles and cars. You could say that my life is split between a very high-tech field of work and a very low-tech field of work! This has given me the opportunity to think differently about high-tech problems, often with a very nice solution as an outcome.   
Besides that, I think old technology is just super cool!

When I’m not found working, I like to relax by playing some guitar or to research something affiliated with previously mentioned topics.

Personality Type:  
Diagram

Description automatically generated with medium confidence

# Context

For this semester, I would like to work on more mechanical aspects of the ICT world. I feel like software and technology are the most recognizable, the most pronounced when they have a mechanical function. Furthermore, the design and different principles which come into play when designing mechanical functionality opens up a whole range of new research and field of works; all which interest me.

Besides this; visualization of data is also an interest I would like to explore. Especially random, generated data. And making a prediction based on this. A lot of the proposed projects offer great chances to do this, think about mapping, dashboarding and maybe even a controlling GUI.   
I think data visualization can create a very simple overview of something very complex for outsiders of the project. And thus is an excellent way of quickly describing and demo-ing your project.

# Project

## Top 3 projects

Top three (Native numeration of projects is used):

2. Autonomous Guided Vehicle Platform

I am very interested in this project since it utilizes a very basic form of data visualization; which is movement. Robots traversing on a set path, with random obstacles creates a challenging situation where some parameters are constant, but the majority is always changing. How to bring order to this chaos?

4. Autonomous exploration of building

Above points can all be inserted in this project too.

Furthermore, it is very interesting since the performance of this project can be directly mapped to known values and metrics. A room with a set size can only be its set size; it doesn’t change. Gathering feedback on the efficiency of this robot is therefore so easy and tangible; that it is very exiting to make it as efficient as possible.

6. Dynamic Sound Level Control in Learning Environments

The most interesting part about this assignment is the suspense of how the frontend of this project (website etc) is going to connect to the actual technology. This was also the main drive for this final choice in my top 3.

## Assigned research project: Autonomous exploration of a building

Ultimately I have been assigned to project #4; Autonomous exploration of a building. This project is led by the ministry of defense, alongside other similar companies and groups.

The project aims to create a robot which operators can use to scan/explore buildings when their layout is unknown. This robot can be used when entering a building in person is dangerous, or difficult. Some examples are hostage situations or firemen wanting to reach a certain location in a burning building.

This project offers great opportunities to work with Unix based systems which definitely is a skill I would like to develop further. There also are great opportunities for data visualization which I proposed earlier, the mapping of an area is naturally all about processing data in various ways to make it understandable.

Currently my focus in the project is like described above, Unix based systematics and mapping. This incorporates the usage of ROS(1) which is used to control everything.

The project isn’t new, two groups have previously done some work on it. We (the group) are the third group working with this robot.

## Personal project

My personal project focusses on vehicles and monitoring their data. For example, oil temperature or RPM. With this data, we can make predictions about engine life or engine wear, then informing the user on this is a main priority. This solves the fact that many people do not really look after their vehicles when it comes to maintenance, mainly because they do not know how. By lowering that difficulty, vehicles can be driven for far longer.

# Learning outcome table with proof

## Products with their description

**Integration of a new camera**

The camera which came with the robot had some issues concerning speed. Speed isn’t the only reason why an upgrade is proposed, the current camera also lacks some features which are explicitly desired by the PO. The most prominent being infrared compatibility to see in the dark.

To fix this, a recommendation by our PO and the previous group was made to upgrade this camera. This required installation and integration into the ROS packages currently running on the robot.  
  
**Integration process of new Lidar**

The Jackal uses lidar data to map its surroundings. Together with RTAB-map, it can create a 2d map of the environment around this. The quality of this map is usually dependent on a few factors, most notably: the lidar used and its quality. The project group received a lidar which is far more accurate and powerful than its previous one.

The current lidar is old and inferior to the newer lidar, it needs to be changed out. However, a lot of processes currently working perfectly fine are dependent on the lidar. So not only does the new lidar need to be integrated, changing the lidar to a new one means all these processes need to be reconfigured.

**Project plan for Personal Project**

To properly keep track of what I am going to do, and (should) have done; I made a project plan to support my personal project in these needs.

Not only does this solve a personal planning goal, but it also means that outsiders of the project can quickly see and judge where and in which stage the project currently is.

**System integration of Object Detection**

To determine points of interests (POI) on the map, the JACKAL makes use of the installed camera to detect objects of interest. It does this using a recognition model using python. The operator can see these points of interest on the map and inform others around him.

While the code for object detection is already present, the integration with the exploration package is very poor/nonexistant. This integration essentially contains a launch file which launches everything at once. The JACKAL currently does not have enough processing power to accommodate for both these high intensity programs at once. This causes the JACKAL to lag tremendously. Indirectly this causes both the exploration and the object detection processes to not perform, or perform very poorly.

This calls for a different system architecture and design.

**Creating GUI**

The Jackal is a product that will be used in high intensity situations, or very low intensity situations. Either way, it needs to have an intuitive and clear user interface. The operators must be able to react quickly on changing scenarios, without having to have technical knowledge of the product. Without such simplicity in its controls, its functionalities will be forever lost in the complexity of separate terminals and different visualization programs.

The Jackal currently has no 1 place where the end user can both see and control the data on the Jackal. To be effectively rolled out as a product; it needs this. The operator in the field cannot be expected to carry a laptop and juggle around CLI (Command Line Interface, otherwise known as Terminal) windows or other programs currently needed for executing certain behavioural actions on the Jackal.

In short, the end user has too much responsibility when it comes to managing and performing the necessities for controlling and monitoring the robot.

**Wiki entry of GUI**

The GUI took a lot of work and googling to make any sense of the vague documentation in place for various javascript libraries used. Not only are some riddled with errors, general knowledge about these topics online seem to be few at best.

The next group has absolutely no idea how the GUI works or how its structured currently. To avoid them having to research all the same (near useless) forums and websites I did; there needs to be a carryover to save them this hassle.

**Presentation Personal Project**

For the entirety of the project, we have been working on a personal project on the Mondays. A lot of work has been done for that personal project and in my case it is about an engine controller.

Everyone around me is not up to speed with my work on the engine controller and does not know what I have done. That is why a presentation is neccesairy.

## Learning outcome table

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| --- | --- | --- |
| **Learning outcome** | **Proof** | **Rating** |
| **1. Analysis** You specify a distributed computer system including timing, resource use and performance, taking into account safety aspects. And you compile an acceptance test plan and an integration test plan. | **Camera Installation**  **Proof of concept Map environmental structures with LIDAR**  **System integration of Object Detection**  **Better autonomous driving** | Current: U  Self: Proficient |
| **2. Advise** Based on your analysis, you provide technical advisory on the (distributed) computer system that is to be realised, including hardware and software components and links. | Personal project  **System integration of Object Detection**  **Better autonomous driving** | Current: U  Self: Beginning |
| **3. Design** You design a distributed computer system including determining actuators, sensors, timing, resource usage and performance. | Personal project  **System integration of Object Detection**  **Better autonomous driving** | Current: U  Self: Beginning |
| **4. Realisation** You realise a complete computer system (or parts thereof) including network, hardware and system software based on your own design. And you compile and carry out an acceptance procedure to validate the implementation. | **Proof of concept Map environmental structures with LIDAR**  **System integration of Object Detection**  **Better autonomous driving** | Current: U  Self: Proficient |
| **5. Manage & Control** You set up and make use of a system for version management, release management, teamwork support and automated testing for hard- and software systems. | **Project plan for Personal Project** | Current: U  Self: Beginning |
| **6. Future-oriented organisation** You explore the organisational context of ICT assignments, make business, sustainable and ethical considerations and manage all aspects of the execution of the assignment. | **Proof of concept Map environmental structures with LIDAR Integration of a new camera**  **System integration of Object Detection**  **Better autonomous driving** | Current: U  Self: Beginning |
| **7. Investigative problem solving** You critically consider IT assignments from different perspectives, identify problems, find an effective approach and come up with appropriate solutions. | **Project plan for Personal Project Proof of concept Map environmental structures with LIDAR Integration of a new camera**  **System integration of Object Detection**  **Better autonomous driving** | Current: U  Self: Proficient |
| **8. Personal Leadership** You are entrepreneurial with regard to ICT assignments and personal development, pay attention to your own learning ability and you keep in mind what kind of ICT professional and/or what type of positions you aspire to. | PDD document  Feedback moments | Current: U  Self: Proficient |
| **9. Targeted Interaction** You determine which partners play a role in the ICT assignment, collaborate constructively with them and communicate appropriately to achieve the desired impact. | Integration of a new camera  Visit to SSC | Current: U  Self: Beginning |

# Sprint retrospective and personal reflection

**Sprint 1**

This sprint brought with it a lot of good work, both qualitative and quantitative; it was missing a bit of documentation though. I feel like I did a lot of good work, but I missed the point of documenting it properly. Both because Im not that good at it; and the severely different way of work this semester. It really does not play into how I usually work/go about documentation well. The work itself was good since technically it all worked out. Not only that, I was also able to communicate it to my group very well. Something they seemed to like. This made the first sprint for me very enjoyable since it all worked out well!

I aim to improve this the next sprint.

**Sprint 2**

This sprint I tried to pay more attention to what I was doing and documenting this properly. The last sprint I think I lacked in this. I also tried to better this by planning a feedback moment with the teacher, to gauge where I am at a few days before the deadline. This way I can improve upon my documentation skills and in a timely manner make adjustments.

I also worked a lot on the LIDAR and camera making major steps in their development process. I think I did very well on bringing new functionality to the table with my work, yet I think next sprint we need to change the roles. I had the feeling that I was continuously researching and prototyping while the rest of the group waited for me to finish. When I was done, I went ahead and explained my work to them and they would refollow all my steps; while I went on with the next bit. I think that is inefficient.

Group retrospective:

As a group we discussed the activities we had in the last three weeks. One very prominent factor that came up was efficiency. We all felt like we had to do something about this, be more structured about this. We tried to put this in motion, by assigning specific tasks to specific persons upfront. This made it all very clear, which before was sometimes a bit vague. We also sat down with one of the group members to confront them about their work, since the consensus was that the rest of the group was not happy with their work; or the lack of it. I think we very clearly and explicitly stated our opinions and that we had a very civil and humane conversation about this. Luckily at the end we could all wrap this up as a group and be happy about the work done.

**Sprint 3**

This sprint I worked very hard to tick some of the learning outcomes I hadnt ticked yet. Namely design, advice and realize. Which I think I did wonderfully. I did all of them. Furthermore I went to the SSC in Oirschot to bring some of my knowledge and questions to possible end users, in the hopes of gaining more insight into how and what I should do in my field of work.

I did alot of work on the project to get things working again. Things which were broken, blocked or even not realized yet; were amongst the things I tackled. I feel very good about this, also in regard of my learning outcomes.

Group retrospective:

Overall, this sprint was the best sprint so far. We all haave a better understanding of the project. The communication between the group could improve, we should talk more about what we epect from each other. Furthermore, each of us should closely look at their chosen US’s, and split them up into smaller US’s so that we dont end up with multiple epics. The coming sprint we have to focus on what we want to deliver to our Product Owner. We are likely going to focus on putting our end product in the form of a dashboard/website, but this still needs to be discussed with ort Product Owner.

**Sprint 4**

This sprint was very challenging for me both in terms of communications and work related. Not only does the group internally seem to develop some uncertainty, but a lot of the work is also stagnant at the moment which does not lighten the mood one bit.

I have tried to be very positive about everything, but sometimes I can also get pretty bogged down into a bad mood. I think I suffered some heavy moments of those type of feelings.

I need to work on my communication skills this next sprint and try to be more of a commerce man than a developer man; that will do me and the group good in sense of communication.

Besides, we have to sell this project to Tim; otherwise I cant shoot my team to shreds with our goal: Playing paintball on the military base; a great motivator for everyone.

Sprint retrospective:

During this sprint, we mostly worked on getting a better git overview, for improved collaboration. We also broke up a lot of user stories to make them smaller and this was necessary as we had problems with code ownership. The git now looks a lot better, and we can hand it over to the next group like this. We restructured our git so that we have a working code on the main. The communication within the group has improved compared to the other sprints. It could, however, still improve a lot on certain parts, for example by implementing two stand-ups a day instead of one. We also changed our way of going about user stories, they are now smaller and easier to demo and prove when they are done. This also helps with code ownership, because everyone has their own (smaller) US to work on. During this sprint, we delivered an almost finished product, namely the dashboard. Coming sprint we want to finish this.

**Sprint 5**

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# Evaluation and reflection on the whole semester

For ‘wrapping up’ the semester. Add an evaluation and a reflection of your whole semester. Your evaluation describes what went good and bad during your process and how you dealt with that. Your reflection describes how you have grown as a person, and what you will take with you in your further professional career (e.g towards the graduation internship).

# Feedpulse

Sprint 1 Feedpulse:

Graphical user interface, text, application, chat or text message

Description automatically generated

Graphical user interface, text, application, email

Description automatically generated

Graphical user interface, text, application

Description automatically generated

Sprint 2:

Graphical user interface, text, application

Description automatically generated

Graphical user interface, text, application, Teams

Description automatically generated

Graphical user interface, text

Description automatically generated

Sprint 4:

A screenshot of a message

Description automatically generated with low confidence

A picture containing text, screenshot, font

Description automatically generated