

Summer internship Intelligence for a Social Robot in a Game

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Learning Report

Abstract—This report documents what I learned during my summer internship at Intelligent Agents and Synthetic Characters Group (GAIPS) in 2014. During the summer internship I worked in a team with three other students and developed a project involving robot Baxter named Baxter Empathetic Agent (BEA) with the subject "Building Intelligence for a Social Robot in a Game". For more details about the activity, consult the activity report that accompanies this report. Throughout the internship I developed cooperation skills, problem solving skills, project management skills, and since I was working in a renown research group, INESC-ID, I had to be more responsible. I also developed effective communication skills throughout the project specially during the final presentation on October 3th. All these skills were successfully improved. The report first shall give an overview of the lessons I learned throughout the project, the obstacles I faced and finally how they were surpassed.

Index Terms—GAIPS, INESC-ID, Internship, Research, Robot, Baxter, BEA, Responsibility, Autonomy, Cooperation, Collaboration, Project management, Team Work, Presentation, Communication, Problem Solving, Self-initiative, Professionalism

TOO MANY! Only 5 or 6

1 INTRODUCTION

THIS report will describe what I have learned and what were my reflections regarding the lessons I learned during my summer internship at GAIPS installations, Instituto Superior Técnico, TagusPark under the supervision of Professor Ana Paiva, Professor Francisco Saraiva de Melo and Eng. Tiago Ribeiro, researchers at INESC-ID.

The team was composed of four students: Rui Oliveira and Diogo Almeida have finished their Integrated Master Degree in Electrical and Computer Engineering (MEEC) at Instituto Superior Técnico (IST), Filipa Correia was still finishing her Master Degree in Information Systems and Computer Engineering (MEIC) at IST and me. At that time, I just finished my BSc's degree in Information Systems and Computer Engineering (LEIC) at IST. Most of the project was done unsupervised giving the team more

autonomy and responsibility.

In the following sections I will describe what I have learned during the execution of this activity, the obtained results and my personal reflections.

2 LESSONS LEARNED

During my summer internship I developed the following skills:

- Autonomy;
- Responsibility;
- Self-initiative;
- Professionalism;
- Cooperation;
- Problem solving;
- Project management;
- Efficient communication.

These lessons will be described with further detail in the following sections.

3 AUTONOMY, RESPONSIBILITY AND PROFESSIONALISM

During the execution of the activity we had to support on ourselves because the supervisors

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	LEARNING					DOCUMENT						
(1.0) Excelent	CONTEXT x2	SKILLS x1	REFLECT x4	S+C x1	SCORE	Structure x0.25	Ortogr. x0.25	Gramm. x0.25	Format x0.25	Title x0.5	Filename x0.5	SCORE
(0.8) Very Good												
(0.6) Good												
(0.4) Fair												
(0.2) Weak												
	1.6	1	4	0.8	7.4	0.25	0.2	0.2	0.25	0.4	0.5	18

did not actively work with us since they were busy working on their own projects. Therefore, we had to be as autonomous as possible and also very responsible because we were the first team in GAIPS working with robot Baxter. As with most software development projects, I sometimes felt frustrated because the progress was very slow due to problems (described in the activity report) that even the supervisors and other researchers could not help. However, we dealt with the problems as a team and, as described in section 4, we had the self-initiative and cooperated with several international researchers in order to solve our problems.

Additionally, since we were working in INESC-ID, we had to behave more professionally by respecting other local researchers workspace by, for example, avoiding excessive noise.

4 SELF-INITIATIVE

As described below in section 8, me and Diogo held the self-initiative and contacted international researchers that were in contact with robot Baxter on an online forum named "MoveIt Users" [1]. Throughout the project, we collaborated with those researchers in order to solve our mutual problems. We also took the liberty of contacting professor João Costeira, from Image Processing course, in order to help us decide what was the recommended image processing algorithm to be used given the project objectives. These self-initiative activities were crucial for advancing in the project.

I also held the self-initiative of developing a rather complete and flexible component for expressing human emotions. In my opinion, since this project was the first of many with robot Baxter, we had to do our best and make the example.

5 COOPERATION

During my internship I had to cooperate with my colleagues in order to accomplish the tasks successfully. In my opinion, the ability to work efficiently in a team is a valuable skill. However, I did not previously worked with my colleagues so I was not accustomed with their work methodologies.

5.1 Conflict resolution

Rui and Diogo were from MEEC background and me, on the contrary, I just finished my BSc's degree in LEIC therefore, sometimes our opinions clashed when discussing what was best for the project.

However, these conflicts did not influence negatively the project. On the contrary, these conflicts were very positive because we have established dialogue and we have solved our differences while earning both trust and respect in the process. One example happened while I was refining the project architecture and re-factoring part of the code. One of my colleagues did not value some software principles such as code readability or code maintainability because he believed that the code was not meant to be examined again and I disagreed with him. The reasons why are not important, the important thing is that we discussed and we established a balance between what we both wanted and made compromises. Later, at the end of the project, we both recognized our mistakes. He recognized that those software principles made the code easier to change, easier to read and easier to find potential errors and I improved something that sometimes can be hard for me: accept other people's opinion.

I also learned that having a BSc's degree in LEIC does not make me an expert on Computer Science and that there has to be a balance between progress and quality in the project specially when it is close to the deadline.

As a result, during the first weeks we started to know each other better and team's productivity rose. We lunched together and we had fun with each other by sharing several brain quizzes. These team building activities contributed greatly to build trust and confidence and to make the team great and successful throughout the summer internship.

6 PROBLEM SOLVING

As described in the activity report, we had several problems when developing the Vision Manager and the Picking Controller responsible for identifying and picking objects, respectively. The integration of both components was complex and the solution was not trivial. We

Verbal Time!

were concerned because the execution of these tasks were taking longer than planned and, as with most projects, any delay can put at risk the execution of the project's objectives.

To solve the problems related with Vision Manager and the Picking Controller and avoid putting at risk the completion of the planned objectives we decided that we had to establish some limitations (described in section 5.4 of the activity report) in order to advance in the project and focus on requirements that are more important. Fortunately, near the end of the project, we were able to remove most of those limitations.

In short, I learned that sometimes some requirements must be relaxed at the cost of being revisited later in the project.

7 PROJECT MANAGEMENT

The situation described in section 6 relates with project management skills because I learned that, similar to other projects I developed during my BSc's degree, it is hard to estimate tasks duration accurately. More effort must be put on project planning by, for example, allocating more time on riskier tasks. Only then, we are able to partially mitigate the risks of having risky tasks that takes longer than planned causing delays in the projects. The experience I obtained during the activity was very important because I would like to be a project manager in the future and I want to avoid these kinds of situations.

8 EFFICIENT COMMUNICATION

Efficient communication skills are among the most valuable soft-skills to have in business and in life. Developing these skills is challenging because, throughout my life I struggle to communicate efficiently. With this activity, I tried to put myself outside my comfort zone in order to overcome my weaknesses.

8.1 Written communication

As described in section 4, I had to contact other researchers, either personally or online, in order to progress in the project. In any case, it was important to communicate my problems

clearly (and professionally) so that they would be understood by other researchers the way I initially intended. Therefore, it was an interesting and different experience from my experience during my BSc's degree at IST because I was working in a research environment with other researchers.

8.2 Public speech

Reference?

Also described in the activity report, me and Filipa presented the final work to the project's supervisors and other INESC-ID researchers. I was very nervous because we worked very hard to assure the project's quality and it was very important to me to have our work recognized and approved by our supervisors. In order to assure it, I had to practice the presentation beforehand to communicate efficiently by speaking slower and more clearly. It was challenging because talking slower and clearly is not natural for me. However, I practiced a lot and managed to talk more slowly during the presentation, kept eye contact and I was able to send the message I intended to transmit during the presentation. Therefore, the results were great and I learned that confidence and preparation are key components for a successful presentation.

9 CONCLUSION

Working at GAIPS was a great experience. The activity met my expectations because it challenged me and allowed me to explore my areas of interest (robots and psychology) in a research environment and helped me grew up as a professional and as a person while expanding my network. To sum up:

- I developed communication skills;
- I developed project management skills;
- I learned how to work in research environments;
- I developed team working skills;
- I became more confident and responsible.

Summer internship are great opportunities to invest in our careers and develop several skills outside the university. During my internship I improved several of my weaknesses regarding communication by working with people with

different backgrounds and by being outside my comfort-zone specially during the final presentation. It was also interesting to work in new environments with project deadlines and with supervisors because the sense of responsibility was greater.

The activity made me a more confident person, however, despite the lessons I learned during my internship I recognize that I still have much to learn. I do not know what the future holds however, I am confident that these lessons will be valuable in the future and I hope to repeat the experience of working in a research project again.

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REFERENCES

- [1] "moveit! users - google groups". Visited on 2015-01-02. [Online]. Available: <https://groups.google.com/forum/#!forum/moveit-users>



Bruno Henriques graduated from IST in 2014 with a BSc's degree in LEIC with a average grade of 17 out of 20. He is currently studying for a MSc's degree in MEIC at IST and he is an active volunteer in Motards Solidários. In the past, he studied English for two weeks in England, he did volunteer work in ReFood and he did volunteer work in Natura Observa during two summers where he received three certificates for his performance.