

Information and Communication Technologies Institute  
**Carnegie Mellon | PORTUGAL**

A N I N T E R N A T I O N A L P A R T N E R S H I P

**Undergraduate Internship Program – Spring 2016**

**Final report**

Visiting Student: Ana Catarina Pires Pinto, MSc. In Bioengineering, FEUP

Host at CMU: Prof. Siddhartha Srinivasa, Head of Personal Robotics Lab at Robotics Institute and professor of Finmeccanica Associate Professor in Computer Science

Host at FEUP: Prof. António Paulo Moreira, Head of Centre for Intelligent Robotics at INESC-TEC and professor at FEUP

Period of visit: 5 May to 18 July 2016

In 2016 Spring, I was at Carnegie Mellon University as an intern in the Personal Robotics Lab, part of the Robotics Institute. This was possible because of the Undergraduate Internship Program, sponsored by CMU Portugal.

The main goal of my stay was to research on vision and sensing for manipulation tasks. I worked directly with Professor Siddhartha Srinivasa, that supervised me throughout this period. I concentrated my work there in Camera Calibration and fusion of data from different sensors. My supervisor was always supportive of my decisions and allowed me to direct the work I was doing at CMU to meet the requirements of my masters thesis, that was presented in the 19<sup>th</sup> of July, 2016.

I worked on the calibration of the camera of a robot and the refinement of objects' pose with data from different sensors. A first approach was tried, but due to its computational expense and less robustness to errors, a second approach was started in the second half of the internship, and is still under development.

One of the most interesting parts of this internship was to be integrated in a team of researchers from CMU. Their method of thinking and the wiliness to always do cutting edge research was fascinating.

Besides the technical skills I gained, I had the chance to improve my English, my team work skills and to present my work to a team of experienced researchers and have their feedback.

During my stay I met several Portuguese people, with whom I visited several places in Pittsburgh and out of town. The city is very nice, always with several things happening, many restaurants and very safe.

Lastly, I would like to thank Fundação para a Ciência e Tecnologia (Portuguese Foundation for Science and Technology) and CMU Portugal for making this internship happen and Professor João Claro that introduced me to these internships.

Porto, July 20th 2016,  
Catarina Pinto