

CMU-PORTUGAL - UNDERGRADUATE INTERNSHIP PROGRAM

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This report will account for my activities performed during my stay in Pittsburgh, Pennsylvania, working as a researcher at the Carnegie Mellon University, from July 10th until September 20th. I was hosted by Professor Frank Pfenning, head of the Computer Science Department, at the School of Computer Science, and advised by Professor Mario Florido, at the Computer Science Department at the Faculty of Science of University of Porto.

The main goal for my internship was to study the complexity of the implementation of some algorithms in SILL (Sessions in Intuitionistic Linear Logic) and CC0 (Concurrent C0), two programming languages based on a strong theoretical basis, using the Curry-Howard Isomorphism. This complexity was measured by the number of messages exchanged between processes running in parallel during the execution of the algorithm. To achieve this, I changed the operational semantics of the language and modified a run-time to account for this change.

This program gave me the opportunity to meet a lot of talented people working in the Computer Science Department at CMU. Besides my host, Professor Frank Pfenning, with whom I had meetings every week, I also worked with several of his PhD. and Post-Doc students, namely Anna Gommerstadt, Stephanie Balzer and Henry DeYoung. I also shared some ideas with Professor Jan Hoffmann, faculty member at the Computer Science Department, who had similar research interests as myself.

During my stay, I also took the chance to explore Pittsburgh, a truly beautiful city. Among many other activities, my personal favourites were attending a Baseball game from the local team, Pittsburgh Pirates, visiting the National Aviary and riding the Monongahela Incline to get a view of Pittsburgh's Downtown from Mount Washington, a stunning scenery.

This experience was invaluable to me, it made me grow as both a person and an academic. Living alone in a different city, a different country, immersed in a totally new culture changes your perspective about life in Portugal. On a personal level, I found that the American people are much more respectful towards their fellow citizens and this realisation inspired me to also change my the way I behave towards strangers, in a positive manner. From an academic point of view, this Summer showed me how researchers in one of the most important universities in America conduct their life, opening my eyes to a reality much different than our

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own. Overall, I would definitely recommend anyone to try to participate in this program.

I would also like to thank the CMU-Portugal Leadership for choosing me to take part in this project, as well as the Foundation for Science and Technology along side INESC-TEC for providing the funding necessary to perform this endeavour. Last, I would like to thank the staff at CMU-Portugal, in particular Ana Lopes and Sara Brandão, for their immense patience and understanding for my delays in answering to emails and special requests for the trip.