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CMU|Portugal Faculty Exchange Program Final Report

Participating in the CMU|Portugal Faculty Exchange Program was a very enriching experience. My visit to CMU had two main goals: 1) learning content, structure and teaching methodologies of specific courses at CMU; and 2) collaborating in research activities with Prof. Dan Siewiorek and his team in the domain of interactive technologies for stroke rehabilitation at the Quality of Life Technology Center (QoLT). Both goals have been fully accomplished even beyond my initial expectations. Concerning the first goal, I attended two courses from the Human-Computer Interaction Institute that I had previously identified as being relevant for my teaching and research interests. The first course was “Applied Machine Learning”, taught by Professor Carolyn P. Rose. This is an important course that exploits various data mining approaches through the application of different machine learning algorithms to a variety of situations, both for pattern understanding and/or prediction. Because of its characteristics and general applicability, the content of this course has practical value for several research topics at my home institution. For example, I envisage using what I learnt in my own research for making predictions concerning recovery after stroke based on demographic characteristics. The second course that I attended was "Human-Computer Interaction Process and Theory" taught by Professor Jen Mankoff. This is a course for PhD students enrolled in the HCI program that covers a number of topics for developing research and teaching skills. Examples include basic guidelines for conducting research, paper and proposal writing, ethical principles in research with human subjects, time management, etc... This is a very rich course that highlights basic principles in research and education. I have been teaching Research Methods for the PhD program in Informatics Engineering at the University of Madeira, and I will definitely incorporate some new content based on what I experienced in the HCI Process and Theory course.

The second goal of my visit to CMU was to collaborate in research activities with my host. I worked in close collaboration with Professor Dan Siewiorek and Professor Asim Smailagic and contributed to an existing CMU project named QoLT Virtual Coach for Stroke Rehabilitation that concerns the development of a computer mediated intelligent system for encouraging, guiding and monitoring the execution of upper limb exercises prescribed to stroke survivors that require ongoing rehabilitation. The current prototype integrates movement tracking, dialogue and emotion recognition to evaluate the physical and emotional state of its users, and adjust the training sessions accordingly. Because of my background and experience, my main tasks were related to the evaluation of the Virtual Coach with end users, i.e., stroke survivors. Taking into account that the Virtual Coach is a tool for home-based rehabilitation, one of the main concerns is to keep the users engaged and interested over time for a sustained use of the rehabilitation tool. For this purpose I designed a within-subjects study with three

conditions that explored the use of different engagement strategies such as gaming and supportive coaching. 20 healthy subjects and 5 stroke survivors participated in this study. The results derived from this study will allow identifying optimal strategies for increasing compliance with home based rehabilitation tools. In addition to these research activities, I was also involved in the preparation of two collaborative research proposals between QoLT and Madeira-ITI for two calls in the context of the CMU|Portugal program, namely the Entrepreneurial Research Initiative and the Early Bird calls.

In summary, spending 4 months at CMU was a very exciting experience that gave me the opportunity to get insights on different teaching and research methodologies that allowed me to grow as a researcher and teacher. Moreover, this was an excellent opportunity to strengthen the collaboration with the Quality of Life Technology Center that will result in joint research activities in the near future.

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