Helen Harman

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I am seeking the opportunity to purse postdoctoral research starting from September/October 2020. My areas of interest include: artificial intelligence, robotics, goal/plan recognition and computer vision. My PhD has been submitted and my public defence is likely to be before the end of June 2020.

Key Achievements and Skills

- My PhD research at Ghent University focused on **symbolic AI** based methods for goal recognition, goal recognition design, action prediction and robot assistance, and on the learning of symbolic action definitions from unlabelled image pairs. (See my list of publications for details.)
- At Aberystwyth University my MEng dissertation, entitled "Artificial Immune System (AIS) for Detecting and Tracking objects in Real-Time", allowed me to gain experience of working on an individual research project. Through this I gained knowledge of **computer vision** and AI concepts.
- During my time at both Ghent University and Aberystwyth University, I gained **teaching experience**. For a System Design (masters level) course, I assisted with practical sessions, which included writing worksheets, and I helped write and mark the practical exam/assignment and a theory exam question.
- I have **reviewed papers**, as a program committee member, for the Plan, Activity and Intention Recognition (PAIR) AAAI workshop.
- While at **CERN**, I worked on the testing and quality assurance of control system software. This involved running nightly graphical user interface tests; developing an automated static code analysis tool and a unit testing framework. These were developed in Python, Java and proprietary language called CTRL.
- I have experience in a **wide range of programming languages**, frameworks and development tools. This includes knowledge of C++, Python, Java, C, ROS, PDDL, Docker, LaTeX and Git.
- I have exceptional **organisational and leadership skills** gained through starting up and running the Aberystwyth University **BCS Student Chapter** and **Computer Science Society**. I was also a member of the **BCS Mid-Wales committee**. Through these groups, I organise events and encourage other students to get involved in computer science outside of their course. I work well as part of a **team** and have shown this by being part of the **Robotics Society**.
- During college I was the student council president and a governor. I helped to organise charity events, listened to what different students wanted and communicated these to the appropriate staff. This helped to develop my organisational skills and my communication skills. I also received the **Outstanding Contribution to the College/Community Award 2011**.

Education

(2016 - 2020) Ghent University:

Doctor of Information Engineering Technology. *Funding*: FWO SB grant
Extracurricular/External courses:
Low Countries Studies (course on the history of Belgium and the Netherlands);
University Language Centre - Dutch language course: A1;
Radboud University (1 week) - Quantum in the Summer: An Introduction to the Theory and Practice of Quantum Technologies.

(2011 - 2016) Aberystwyth University:

M.Eng. Software Engineering : 1st

(2009 - 2011) Birkenhead 6th form College:

A-Levels : Double Award ICT: BB, Computing: B, AS-Levels: Physics: D

(2004 - 2009) South Wirral High School:

GCSE: 10 (A-C grade), including Mathematics : A, Science: AB, Double Award ICT: Distinction
Free Standing Mathematical Qualification (FSMQ): Additional Mathematics: D

Employment

(09/2014 - 07/2016) and (10/2012 - 06/2013) Aberystwyth University:
Advisor, Demonstrator and Ambassador (Part-time)

During advisory, students could ask me any technical questions they have in relation to their course. During demonstrating, it was my responsibility to check through and sign-off worksheets students complete. I had to think quickly when solving their coding problems; and be able to explain different aspects of software development at the correct level of understanding. I have demonstrated in the following areas : Arduino, Robotics, C, Haskell and Java. As an ambassador I showed prospective students around and told them about the University; I had to communicate the relevant information to parents and students.

(07/2015 - 09/2015) Johannes Gutenberg University Mainz:
Summer Intern

I created a Java interface for Scavenger: a tool for computing sub-algorithms in parallel and sharing the results with dependent sub-algorithms. I built a package for Weka that allows Weka's cross fold validation to make use of Scavenger. I also wrote a generic hierarchical clustering algorithm to show the befits of using Scavenger.

(07/2013 - 06/2014) CERN:
Technical Student

I worked in the EN-ICE-SCD section, which provides control system software and support to different experiments. This software makes use of WinCC-OA. I ran nightly graphical user interface tests; develop an automated static code analysis tool and a unit testing framework.

Publications

- Harman, H. & Simoens, P. (2020). Generating Symbolic Action Definitions from Pairs of Images: Applied to Solving Towers of Hanoi, In Plan Activity Intention Recognition (PAIR) workshop part of AAAI'20 *(Accepted)*
- Harman, H. & Simoens, P. (2020). Action Graphs for Goal Recognition Problems with Inaccurate Initial States (Student Abstract), Thirty-Fourth AAAI Conference on Artificial Intelligence. *(Accepted)*
- Harman, H. & Simoens, P. (2020). Action Graphs for proactive robot assistance in smart environments, Journal of Ambient Intelligence and Smart Environments. *(Accepted)*
- Harman, H., Chintamani, K., & Simoens, P. (2019). Robot Assistance in Dynamic Smart Environments—A Hierarchical Continual Planning in the Now Framework, Sensors 19(22): 4856. [PDF]
- Harman, H. & Simoens, P. (2019). Action Graphs for Performing Goal Recognition Design on Human-Inhabited Environments, Sensors 19(12): 2741. [PDF]
- Harman, H. & Simoens, P. (2019). Solving Navigation-Based Goal Recognition Design Problems with Action Graphs, In Plan Activity Intention Recognition (PAIR) workshop part of AAAI'19. [PDF]
- Harman, H., Chintamani, K., & Simoens, P. (2018). Action Trees for Scalable Goal Recognition in Robotic Applications, In the 6th workshop on Planning and Robotics (PlanRob) part of ICAPS,(pp. 90-94). [PDF]
- Harman, H., Chintamani, K., & Simoens, P. (2017). Architecture for Incorporating Internet-of-Things Sensors and Actuators Into Robot Task Planning in Dynamic Environments. In International Symposium on Robotics and Intelligent Sensors (IRIS), (pp. 13-18), IEEE. [PDF]

Interests

I enjoy exploring new places, going on short hikes, and taking photos. Through the Aberystwyth BCS Student chapter and Computer Science Society I organised events, and in the future would like the opportunity to be involved in organising events, workshops and conferences.

References

References are available on request.