Giovanna Broccia

Curriculum Vitae

3, Via delle Sette Volte
Pisa, Italy 56126
✆ *(+39) 347 4928625*
✉ *giovanna.broccia@di.unipi.it*

Current Position

November 2018 - present	**Research fellow**, *University of Pisa, Department of Computer Science.*
Subject	*Model-based analysis of data on usage of biomedical devices in multitasking situations*

Education

2015–2018	**PhD Student, Computer Science**, *Università di Pisa.*
2011–2015	**MS, Digital Humanities (LM-43)**, *Università di Pisa*, *110/110 summa cum laude.*
2006–2011	**BS, European Literatures for Publishing and Cultural Production (L-10)**, *Università di Pisa*, *100/110.*

Ph.D. Thesis

Title	*A Formal Framework for Modelling and Analysing Safety-Critical Human Multitasking*
Supervisor	Prof. Paolo Milazzo
Description	This thesis is focused on the creation of a formal model of a multitasking interaction with safety-critical systems. The model describes the cognitive processes involved in human-computer interaction and the switching of attention among concurrent tasks, and it builds on classical results from applied psychology on selective attention and working memory.
	The model has been implemented through a Java Simulator, which can be used to have a quick feedback on whether users can safely complete multiple tasks at the same time.
	Afterward, the model has been implemented through a computational model in Real-Time Maude, which enables us to analyse multitasking through simulation and reachability analysis.
	We validate the algorithm underlying the model, against data gathered from an experimental study we devised in collaboration with a group of psychologists of the University of Pisa. We implemented a web application where users were asked to interact with two concurrent tasks.
	Finally, we show how a number of prototypical multitasking problems can be analysed in Real-Time Maude by applying our framework to three case studies.

Masters Thesis

Title *A Domain Specific Language for Game Modelling and Analysis*

Supervisor Prof. Paolo Milazzo

Description This research broadly extends a previous work which deploys PRISM Model Checker for modelling and analysing board games. Specifically, we devised and developed a Domain Specific Language (DSL) in order to improve the expressiveness, effectiveness and conciseness of the original modelling. This novel DSL further enhance the previous work by allowing to the user to model a wider set of features of the board game.

Technical Skills

PL JAVA, MAUDE, PRISM MODEL CHECKER

Web CSS, HTML, XML, JAVASCRIPT

IDE ECLIPSE

Soft. Pack. ADOBE INDESIGN, ADOBE ILLUSTRATOR, ADOBE PHOTOSHOP, GIMP, INKSCAPE

Soft Skills

Design and organisation of users studies

Design and organisation of an experimental users study described in the PhD thesis "A Formal Framework for Modelling and Analysing Safety-Critical Human Multitasking" by G. Broccia. A web application has been devised where real users are asked to interact with two concurrent tasks. All data about the interaction with the application are automatically collected. The test consists of two parts, available at http://pages.di.unipi.it/milazzo/AppSpans/ and http://pages.di.unipi.it/milazzo/AppSpans2/

Teaching Roles

26 October 2016 - **Teaching Assistant**, *Digital Humanities, Università di Pisa*.
16 December 2016

Creation of the exams' projects specifications for the Programming Fundamentals and Data Analysis course (Java Programming module)

Visiting Research

1 September 2018 **University of Edinburgh**, *School of Informatics*.
- 1 October 2018

11 June 2018 **École Polytechnique, Inria Saclay Île-De-France**.
- 24 June 2018

13 February 2018 **University of Minho**, *School of Engineering*.
- 31 March 2018

6 February 2017 **University of Oslo**, *Department of Informatics*.
- 13 May 2017

Professional Activities

2018	2nd Workshop on Formal Co-Simulation of Cyber-Physical Systems (COSim-CPS 2018)
	Program committee member
2018	Medical Cyber Physical Systems Workshop 2018 (MCPS 2018)
	Subreviewer
2018	10th International Conference on Bioinformatics Models, Methods and Algorithms (BIOINFORMATICS 2019)
	Subreviewer

Languages

Italiano	**Mothertongue**
English	**Intermediate**
Spanish	**Intermediate**
French	**Basic**

Awards

2015	**Pegaso Doctorate Scholarship**.
	Scholarship funding my Ph.D. studies

Ph.D. Schools

2016	Bertinoro International Spring School (BISS)

Others

2019	Organizer of "Ph.D. event at Computer Science Department, University of Pisa"
2017 - 2018	Ph.D. representative in the Ph.D. council

Publications

Under minor review	G. Broccia, P. Milazzo, P. C. Ölveczky. "Formal Modeling and Analysis of Safety-Critical Human Multitasking" *in Innovations in Systems and Software Engineering, a NASA Journal*
2019	G. Broccia. "A Formal Framework for Modelling and Analysing Safety-Critical Human Multitasking" *Ph.D. Thesis (submitted and revised), University of Pisa*
2018	G.Broccia, P. Masci, P. Milazzo. "Modeling and Analysis of Human Memory Load in Multitasking Scenarios: Late-Breaking Results" *in Proceedings of the ACM SIGCHI Symposium on Engineering Interactive Computing Systems (EICS 2018): 9-15. ACM*
2018	G. Broccia, P. Milazzo, P. C. Ölveczky. "An Executable Formal Framework for Safety-Critical Human Multitasking" *in NASA Formal Methods Symposium (NFM 2018): 54-69. Springer, Cham.*

2017   G. Broccia, P. Milazzo, P. C. Ölveczky. "An Algorithm for Simulating Human Selective Attention" *in International Conference on Software Engineering and Formal Methods (SEFM 2017) : 48-55. Springer, Cham.*

2017   G. Broccia. "Model-Based Analysis of Driver Distraction by Infotainment Systems in Automotive Domain" *in Proceedings of the 2017 ACM SIGCHI Symposium on Engineering Interactive Computing Systems (EICS 2017): 133-136*

2016   P. Milazzo, G. Pardini, G. Broccia. "Towards a High-Level Model Checking Language: Object-orientation, Data Structures and Local Variable Pruning" *in International Workshop on Formal Methods for Industrial Critical Systems and Automated Verification of Critical Systems (FMICS-AVoCS 2016)*