

# Simone BARLOCCO

*Curriculum Vitae et Studiorum*

## PERSONAL DATA

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PLACE OF BIRTH: Legnano (MI), Italy.  
DATE OF BIRTH: 05 February 1991.  
GENDER: Male.  
ADDRESS: Computer and Information Sciences, University of Strathclyde,  
26 Richmond Street, G1 1XH, Glasgow, Scotland, UK.  
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## CURRENT POSITION

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SINCE 10/2016 **PhD Student in the Mathematically Structured Programming Group**, University of Strathclyde, Glasgow.  
*Supervisor*: Clemens Kupke (Department of Computer and Information Sciences, University of Strathclyde).

## RESEARCH INTERESTS

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Automata Learning, Coalgebra Theory, Databases, Formal Languages, Proof Assistants, Program Semantics, Algorithms' Analysis.

## EDUCATION

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07/2017 **ESSLI Summer School**, University of Toulouse, Toulouse, France.  
10/2013-04/2016 **Master's Degree in Logic, Philosophy and History of Science**, University of Florence, Florence. | [DETAILED LIST OF EXAMS](#)  
*Dissertation mark*: 110 e Lode/110 (First class with distinction).  
*Dissertation*: Formalizzazione del calcolo relazionale in HOL Light – Formalization of Relational Calculus in HOL Light. | [ABSTRACT](#)  
*Supervisor*: Marco Maggesi (Department of Mathematics, University of Florence).  
10/2010-12/2013 **Bachelor's Degree in Philosophy**, Catholic University of the Sacred Heart, Milan. | [DETAILED LIST OF EXAMS](#)  
*Dissertation mark*: 108/110.  
*Dissertation*: Il problema dell'infinito in Cantor.  
*Supervisor*: Ciro de Florio (Department of Philosophy, Catholic University of the Sacred Heart).  
09/2012-02/2013 **Erasmus Student**, University of Vienna, Vienna, Department of Philosophy. | [DETAILED LIST OF EXAMS](#)  
09/2005-07/2010 **High School Diploma in Scientific Studies**, Liceo Scientifico Galileo Galilei, Legnano.  
*Mark*: 84/100.

## TALKS AND POSTER CONTRIBUTIONS

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11 JAN 2018 **Contributed talk**, Angluin Learning via Logic, *LFCS*, Dearfield Beach, Florida.  
19 JUN 2017 **Contributed talk**, Learning via Logic, *LearnAut* workshop in *LICS*, University of Reykjavik, Iceland.  
13 JUN 2017 **Contributed talk**, Learning via Logic, *CALCO Early Ideas*, University of Ljubljana, Slovenia.

## ORGANISING COMMITTEES

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2017 Selected member of SICSA 2018 Conference Organising Committee.

## LIST OF PUBLICATIONS

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Note that in Computer Science, conference papers count equally with journal papers.

◦ **Proceedings**

[1] Simone Barlocco and Clemens Kupke, *Angluin Learning via Logic*, LFCS (2017).

## SCHOLARSHIPS, GRANTS AND AWARDS

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- 2018 SICSA Summer & Winter School Bursaries (£500).
- 2016 Student Excellence Award, University of Strathclyde (home fee and stipend for three years PhD position).
- 2015 Selected Candidate in the Notice of University of Florence Competition for Student Part-time Job (1162.50 Euro for 150 hours of work in the university library by the University of Florence).
- 2012 Erasmus Scholarship (1700 Euro Grant by Catholic University of the Sacred Heart – Erasmus Project).

## TEACHING EXPERIENCE

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- 2018 Demonstrator for Topic in Computing 2 course, University of Strathclyde.
- 2017 Demonstrator for User and Data Modeling course, University of Strathclyde.
- 2017 Demonstrator for Topic in Computing 2 course, University of Strathclyde.
- 2016 Demonstrator for User and Data Modeling course, University of Strathclyde.

## LANGUAGE SKILLS

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- ITALIAN: Native.
- ENGLISH: C1 – *IELTS*, Band 7, June 2016.
- GERMAN: B2 – *Goethe-Zertifikat*, Grade: gut, March 2015.

## COMPUTER SKILLS

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- INTERMEDIATE KNOWLEDGE: HOL Light,  $\text{\LaTeX}$ , Microsoft Office, SQL, Haskell.
- BASIC KNOWLEDGE: CSS, HTML, Java, DynamoDB.

## OTHER INTERESTS

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- Volleyball player and trainer.
- Technology and computer.
- Books, traveling and cinema.

Updated February 23, 2018

## Master's Degree in Logic, Philosophy and History of Science Grades<sup>1</sup>

EXAM	GRADE	CREDIT CFU
Algorithms and Data Structures	30Laude/30	12
Semantics and Lexicology	30/30	6
Graduand's Seminar: Theory of Programming Languages	Approved	6
Logic 2	30/30	6
Logic 1	27/30	12
Advanced Topics on Philosophy of Science	30Laude/30	12
Foundations and Concepts of Contemporary Physics	30/30	6
Philosophy of Logic and Language	29/30	12
History of Biology	30/30	6
Mathematical Logic	28/30	6
History of Contemporary Philosophy	30Laude/30	6

### Abstract

The aim of this work is the formalization of relational calculus through a proof assistant. In this particular case, we will use HOL Light. The main goal of this master's dissertation is to encode the relational calculus. In addition, we will also formalize a relational algebra in order to prove that its expressive power is at least the same as the former. Hence, here we will prove a part of the Codd's theorem which states that relational calculus and relational algebra are equivalent in expressive power. In Chapter 4, we will explain the main steps of the work that allowed to achieve the goal. It is important to highlight that we cannot report all the lines of the code we wrote (nearly two thousand). Therefore, we will only provide those parts we need to make the explanation clear. Moreover, we obtained the final code through several steps of modifications and changing. The background of this work has its roots in two main fields: on the one hand, the database systems, on the other hand, the mechanizing proof. The first three chapters define both of them. Indeed, in Chapter 1, we will outline the fundamental features of database systems. In Chapter 2, we will introduce the relational model and, in particular, two of its foundational query languages: the domain relational calculus and the relational algebra. In Chapter 3, we will first define the idea of mechanizing proof by an historical introduction and then we will explain the development and the main features of HOL Light.

<sup>1</sup>The exams above, as well as the related classes, were held in Italian; their names have only been translated into English, apart from the courses which were taken during the Erasmus Program that were held in German.

## Bachelor's Degree in Philosophy Grades

EXAM	GRADE	CREDIT CFU
Theology III	30Laude/30	
Epistemology*	30/30	6
Social Ethics*	29/30	6
Foundations of Mathematics*	23/30	6
German Language (Module for Specialised Texts)*	29/30	6
History of Contemporary Philosophy	27/30	12
History of Philosophy from Kant to Hegel	30Laude/30	6
Logic (Advanced Course -A)	30Laude/30	6
Other Educational Activities: International Career Card	Approved	1
Theology II	30/30	
Foundations of the Philosophy of Science	30/30	6
General Mathematics (I Module)	30Laude/30	6
History of Philosophy	27/30	12
History of Philosophy (Institutions)	26/30	6
Moral Philosophy	26/30	12
Philosophy of Science	30/30	6
Theoretical Philosophy	30/30	12
Theology I	30/30	
Contemporary History	26/30	12
English Language	Approved	6
History of Ancient Philosophy	30/30	12
History of Medieval Philosophy	27/30	12
History of Science	26/30	6
ICT and Information Society	Approved	6
Logic	29/30	6
Ontology	30/30	6

This star (\*) indicates that the course was taken at University of Vienna during the Erasmus Program.

## Exchange Program at University of Vienna Grades

EXAM	GRADE	CREDIT ECTS
Erkenntnislehre	1/5	3,0
Sittlichkeit und Verantwortung – Zwei Grundbegriffe der Etik	2/5	4,0
Was ist Mathematik?	4/5	5,0
Anleitung zum Sprachen- und Studienprozessportfolio	2/5 – 1/5	2,0