
BIOGRAPHICAL SKETCH

NAME: Cardelli, Luca

eRA COMMONS USER NAME:

POSITION TITLE: Royal Society Research Professor, University of Oxford

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
University of Pisa, Italy	B.S	07/1978	Computer Science
University of Edinburgh, UK	Ph.D.	04/1982	Computer Science

A. Personal Statement

During three separate phases of my career, I have served as a chair of three area-defining conferences: POPL 1998 (Principles of programming languages), ECOOP 2003 (Object-oriented programming), and DNA 2011 (DNA computing and molecular programming), and received technical awards in each area. I am coauthor with Martin Abadi of an influential book on object-oriented principles (A Theory of Objects, 1996, still in press). While always working in industrial research labs, my articles have collected over 27000 references, and at one point I was identified as the 3rd most acknowledged computer scientist (PNAS 0407743101, 2004).

B. Positions and Honors

Positions and Employment

1982-1985 Member of Technical Staff. AT&T Bell Laboratories, Murray Hill, NJ.
 1984 Adjunct Professor. Department of Computer and Information Science, University of Pennsylvania, Philadelphia, PA.
 1985-1997 Member of Research Staff. Digital Equipment Corporation, Systems Research Center, Palo Alto, CA.
 1997- Principal Researcher. Microsoft Research, Cambridge, UK.
 2013- Royal Society Research Professor, University of Oxford, UK.

Other Experience and Professional Memberships

1982- Member of the European Association for Theoretical Computer Science
 1986-1995 Member, IFIP Working Group 2.2 (Formal Description of Programming Concepts)
 1988-2000 Founding Member, IFIP Working Group 2.8 (Functional Programming)
 1998-2004 Fellow of Girton College, Cambridge, UK
 2005-2007 Visiting Professor, University of Trento, Italy
 2007-2012 Visiting Professor, Imperial College London, UK
 2010-2013 Visiting Professor, University of Oxford, UK
 2014- Adjunct Fellow of Linacre College, Oxford, UK
 2015- Guest Scholar at the IMT School for Advanced Studies, Lucca, Italy

1994-1999 Associate Editor, Theory and Practice of Object Systems.
 1995-2004 Member of the Editorial Board, Journal of Functional Programming.
 1999-2006 Member of the Editorial Board, Science of Computer Programming.
 2001-2007 Member of the Scientific Board, Mathematical Structures in Computer Science.
 2004-2012 Member of the Editorial Board, Transactions on Computational Systems Biology.
 2008- Member of the Editorial Board, Theory of Natural Computing.
 2011-2015 Member of the Scientific Board of INRIA (French National Research Institute in Informatics).

- 2012-2014-2016 Member of the Editorial Board, Electronic Proceedings in Theoretical Computer Science.
Subject Editor for Computer Science, Royal Society Open Science.
- 1998 Program chair of the ACM Symposium on Principles of Programming Languages (POPL'98).
2003 Program chair of the European Conference on Object Oriented Programming (ECOOP'03).
2011 Program co-chair of the International Conference on DNA Computing and Molecular Programming (DNA17).

Honors

- 2004-2005-2005-2006- Elected Member of the Association Internationale pour les Technologies Objets
Fellow of The Royal Society
Fellow of the Association for Computer Machinery
Elected Member of the Academia Europaea
- 2005 Most Influential POPL Paper Award (for 1995)
2007 Most Influential ETAPS Paper Award (for 1998)
2007 AITO Dahl-Nygaard Senior Prize
2010 Most Influential POPL Paper Award (for 2000)
2012 The Rozenberg Tulip Award in DNA Computing
2015 Association for Computer Machinery, Programming Languages Achievement Award

C. Contribution to Science

1. Programming Languages and Type Theory (1982-1996).
 - a) [On understanding types, data abstraction, and polymorphism](#)
L Cardelli, P Wegner
ACM Computing Surveys (CSUR) 17 (4), 471-523
 - b) [A semantics of multiple inheritance](#)
L Cardelli
Information and computation 76 (2-3), 138-164
 - c) [Explicit substitutions](#)
M Abadi, L Cardelli, PL Curien, JJ Lévy
Journal of functional programming 1 (4), 375-416
 - d) [Subtyping recursive types](#)
RM Amadio, L Cardelli
ACM Transactions on Programming Languages and Systems (TOPLAS) 15 (4), 575-631
2. Distributed Systems and Concurrency Theory (1993-2005).
 - a) [A language with distributed scope](#)
L Cardelli
Computing Systems, 8(1):27-59
 - b) [Mobile ambients](#)
L Cardelli, AD Gordon
Theoretical computer science 240 (1), 177-213
 - c) [Anytime, anywhere: Modal logics for mobile ambients](#)
L Cardelli, AD Gordon
Proceedings of the 27th ACM SIGPLAN-SIGACT symposium (POPL) pp 365-377
3. Computational Biology (2001 - current).
 - a) [BioAmbients: an abstraction for biological compartments](#)
A Regev, EM Panina, W Silverman, L Cardelli, E Shapiro
Theoretical Computer Science 325 (1), 141-167
 - b) [The cell cycle switch computes approximate majority](#)
L Cardelli, A Csikász-Nagy
Scientific reports 2, 656
 - c) [Morphisms of reaction networks that couple structure to function](#)
L Cardelli
BMC systems biology 8 (1), 84

- d) **Maximal aggregation of polynomial dynamical systems**
L Cardelli, M Tribastone, M Tschaikowski, A Vandin
Proceedings of the National Academy of Sciences, 201702697

4. **DNA Nanotechnology (2009 – current)**

- a) **A programming language for composable DNA circuits**
A Phillips, L Cardelli
Journal of the Royal Society Interface 6 (Suppl 4), S419-S436
- b) **Two-domain DNA strand displacement**
L Cardelli
Mathematical Structures in Computer Science 23 (2), 247-271
- c) **Programming chemistry in DNA-addressable bioreactors**
H Fellermann, L Cardelli
Journal of The Royal Society Interface 11 (99), 20130987
- d) **Programmable chemical controllers made from DNA**
YJ Chen, N Dalchau, N Srinivas, A Phillips, L Cardelli, D Soloveichik, ...
Nature nanotechnology 8 (10), 755-762

Complete List of Published Work:

Google Scholar: <https://scholar.google.com/citations?user=npBTgSsAAAAJ&hl=en>

Homepage: <http://lucacardelli.name/indexPapers.html>

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

RP120138 Luca Cardelli 2013/09/01-2018/08/31 (5-year renewable)
Royal Society Research Professorships 2012, University of Oxford.
Role: PI

RP\EA\180013 Luca Cardelli 2017/10/01-2021/03/31
Research Professorship Enhancement Award 2017, University of Oxford.
Integrated Scientific Modeling and Lab Automation for Molecular Programming.
Role: PI

Completed Research Support