

# Emanuele D'Oswaldo

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## Current position

- Sep 2018–present** **Marie Curie Research Fellow**, Computing Department, *Imperial College London*, UK  
*Topic* Compositional verification and specification for progress and security properties of concurrent software, integrating separation logics, automata theory and process algebra.  
*Funding* Two years EU funded fellowship (H2020-MSCA-IF-2017 795218)

## Experience

- Apr 2017–Sep 2018** **Research Associate**, Program Specification and Verification Group, *Imperial College London*, UK  
*Topic* Abstraction and compositionality for proving liveness of concurrent software (with Prof. Philippa Gardner)
- May 2015–Apr 2017** **Postdoctoral Researcher**, *Concurrency Theory Group*, TU Kaiserslautern, Germany  
*Topic* Logics and Automata for Infinite State Model Checking (with Prof. Roland Meyer)

## Education

- 2010–2015** **PhD in Computer Science**, *University of Oxford*, Merton College, UK  
*Thesis* Verification of Message Passing Concurrent Systems (supervisor: Prof. Luke Ong)  
*Awards* [Winner of the 2016 BCS/CPHC Distinguished Dissertation award](#)
- 2007–2010** **M.Sc. in Computer Science**, *University of Udine*, Italy, 110/110 *cum laude*  
Dissertation on static analysis of Bigraphs by Abstract Interpretation
- 2004–2007** **B.Sc. in Computer Science**, *University of Udine*, Italy, 110/110 *cum laude*  
Dissertation on Monads and Arrows in Haskell
- Oct 2007–Mar 2008** **Exchange Student (Erasmus)**, *Istanbul Bilgi Universitesi*, Istanbul, Turkey

## Awards

- 2016** **Winner of the Distinguished Dissertation award**, *BCS/CPHC*, UK  
Best British PhD dissertation in Computer Science selected by the Council of Professors and Heads of Computing, and the BCS Academy of Computing.
- 2004–2010** **Scatcherd European Scholarship**, *University of Oxford*, UK  
University-wide fully-funded PhD scholarship.
- 2004–2010** Student of **Scuola Superiore**, *University of Udine*, Italy  
University-wide fully-funded 5 years scholarship for excellent students. Members are annually reviewed and required to attend extra courses. See [scuolasuperiore.uniud.it](http://scuolasuperiore.uniud.it).

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## Publications

My research output is characterised by high-quality papers in top-tier conferences.

📄 Total citations 76 (Google Scholar, Jan 2019).

- CSF'17** **Deciding Secrecy of Security Protocols for an Unbounded Number of Sessions: The Case of Depth-bounded Processes**, with *Luke Ong and Alwen Tiu*.  
In Proc. of Computer Security Foundations. IEEE Computer Society. 2017.  
📄 Citations 3 📊 CORE rank A 📄 Length 17 pages
- LICS'16** **First-order Logic with Reachability for Infinite-State Systems**, with *Roland Meyer and Georg Zetsche*. In Proc. of Symposium on Logic in Computer Science, ACM. 2016.  
📄 Citations 2 📊 CORE rank A\* 📄 Length 18 pages + 3 appendix
- ESOP'16** **On Hierarchical Communication Topologies in the  $\pi$ -calculus**, with *Luke Ong*.  
In Proc. of European Symposium on Programming. Vol. 9632 of LNCS. Springer. 2016.  
📄 Citations 2 📊 CORE rank A 📄 Length 27 pages + 14 appendix
- SAS'13** **Automatic Verification of Erlang-Style Concurrency**, with *Jonathan Kochems and Luke Ong*. In Proc. of Static Analysis. Vol. 7935 of LNCS. Springer. 2013.  
📄 Citations 49 📊 CORE rank A 📄 Length 18 pages + 5 appendix
- AGERE'12** **Soter: an Automatic Safety Verifier for Erlang**, with *Jonathan Kochems and Luke Ong*.  
In Proceedings of the 2nd edition on Programming systems, languages and applications based on actors, agents, and decentralized control abstractions. ACM. 2012.  
📄 Citations 20
- Monograph** **Verification of Message Passing Concurrent Systems**. BCS/CPHC Distinguished Dissertation Award Series, ISBN 978-1-78017-363-4, BCS. 2016.

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## Teaching

- 2016/2017** **Lecturer** of Concurrency Theory, *TU Kaiserslautern*, Germany  
Full 40 hours MSc course, designed syllabus, prepared material and exercises, managed 2 assistants, handled examinations. Student evaluations were outstanding (ranked 2nd).
- 2016** **Lecturer** of Advanced Automata Theory, *TU Kaiserslautern*, Germany  
Full 40 hours MSc course, prepared material and exercises, managed 2 assistants, co-handled examinations. Student evaluations were outstanding.
- May–Jul 2015** **Teaching Assistant** for Concurrency Theory, *TU Kaiserslautern*, Germany
- Jun 2013–Mar 2014** **Tutor** at Merton College, *University of Oxford*, UK  
*Subjects* Concurrent Programming, Imperative Programming 2  
Weekly highly interactive tutorials to groups of 4 undergraduates.
- 2011–2014** **Teaching Assistant**, Dept. of Computer Science, *University of Oxford*, UK  
*Subjects* Imperative Programming (Scala), Concurrent Programming (Scala),  
Functional Programming (Haskell), Concurrency (CSP).

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## PhD and Project supervision

- 2017–ongoing** Assistant Supervisor of **Julian Sutherland**, PhD in Computer Science, *Imperial College*  
*Topic* Compositional Termination proofs of Fine-grained Concurrent Programs
- 2018–ongoing** **Felix Stutz**, MSc Computer Science, *Saarland University*, Germany  
*Topic* Automatic verification of cryptographic protocols through inductive invariants
- 2018** **Blaine Rogers**, Joint Mathematics and Computing, *Imperial College London*  
*Thesis* A  $\pi$ -calculus Abstraction for Erlang

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## Invited Talks

- Jan 2019** Invited talk at **Open Problems in Concurrency Theory**, Lisbon, Portugal  
Invitation-only research seminar organised by IFIP-WG 1.8 co-located with POPL'19.  
*Topic* *Progress for Concurrent Programs*
- Aug 2016** Participated to the invitation-only **Automata, Logic and Games research meeting**, Institute of Mathematical Sciences, National University of Singapore.
- Aug 2016** Invited talk at **Workshop on Communicating, Distributed and Parameterized Systems**, NUS, Singapore  
*Topic* *The Hierarchical  $\pi$ -calculus*

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## Research Talks

- Deciding Secrecy of Security Protocols for an Unbounded Number of Sessions**  
*Sep 2017* Highlights of Logics, Games and Automata, Queen Mary University of London  
*Aug 2017* CSF'17, UCSB, Santa Barbara, USA
- First-order Logic with Reachability for Infinite-State Systems**  
*Jul 2016* LICS'16, Columbia University, New York City, USA
- On Hierarchical Communication Topologies in the  $\pi$ -calculus**  
*Dec 2016* IMDEA Software, hosted by Boris Köpf, Madrid  
*Aug 2016* Nanyang Technological University, hosted by Alwen Tiu, Singapore  
*Apr 2016* ESOP'16, ETAPS, Eindhoven, Netherlands  
*Mar 2016* D-CON'16, Universität des Saarlandes, Saarbrücken, Germany  
*Feb 2016* Oxford Advanced Seminar on Informatic Structures, University of Oxford  
*Feb 2016* Nobuko Yoshida's group, Imperial College, London
- Precise Abstractions of Concurrent Systems**  
*Aug 2014* Pawel Sobocinski, University of Southampton
- Automatic Verification of Erlang-Style Concurrency**  
*Jun 2013* SAS'13, Seattle, USA  
*Jan 2013* Student Short Talk Session at POPL'13, Rome

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## Academic Activities

- Program Committee** Erlang Workshop 2018, EXPRESS/SOS 2019
- Organisation** Local organiser for MFPC/CALCO 2019 in London
- Reviewer** *Conferences:* SAS 2018, PLDI 2018, CONCUR 2018/2017/2015, ERLANG 2018, FoSSaCS 2017, TACAS 2016, NETYS 2016, MFCS 2012, LICS 2015, FSTTCS 2015, VMCAI 2014, DMC 2014, TAMC 2012, POPL 2012, TLCA 2011.  
*Journals:* Information and Computation, Information and Software Technology, Mathematical Structures in Computer Science.

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## Research Software

- IdealCrypto** A tool to automatically prove secrecy of security protocols
- New way of proving secrecy without bounds on the number of sessions (with F. Stutz).
- Soter** A proof-of-concept static analyser for Erlang programs (with J. Kochems).
- Demo* <http://mjolnir.cs.ox.ac.uk/soter/>
- JamesBound** A proof-of-concept implementation of my ESOP'16 type system for the  $\pi$ -calculus
- Website* <http://github.com/bordaigor1/jamesbound>
- Includes an Haskell framework for analysing the  $\pi$ -calculus.
- Stargazer** An innovative, instructional, interactive execution environment for the  $\pi$ -calculus
- Website* <http://stargazer.emanueledosualdo.com>
- Used as a teaching/presentation aid in my talks and lectures, with excellent student engagement and feedback.

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## Other skills

- Languages** Italian (native speaker) • English (fluent)
- Programming** Haskell, Python, JavaScript, Scala, Java, Erlang
- Music** Studied violin for more than ten years playing Classical Music and Jazz.  
Studied Musical Composition from 2000 to 2005 at the conservatory of Udine.