

# Emanuele D'Oswaldo

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## Current position

Sep 2020–present **Postdoctoral Researcher**, Foundations of Programming group,  
*Max Planck Institute for Software Systems*, Saarbrücken, Germany.  
*Topic* Concurrent Separation Logics, Hyperproperties, Non-Volatile Memory Models,  
Refinement (with Prof. Derek Dreyer).

## Experience

Sep 2018–Aug 2020 **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).  
Apr 2017–Sep 2018 **Research Associate**, *Imperial College London*, UK.  
*Topic* Concurrent Separation Logic (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: 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 & Fellowships

2018 **Marie Skłodowska-Curie Individual Fellowship**, *EU Horizon 2020*.  
*Grant Title* Verification and Specification through Progress Abstractions (VeSPA).  
*Budget* € 195.454,80 for 2 years (grant number 795218).  
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.  
2010–2013 **Scatcherd European Scholarship**, *University of Oxford*, UK.  
University-wide fully-funded PhD scholarship.  
2004–2010 **Scuola Superiore Student Fellowship**, *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

- POPL'23 *E. D'Oswaldo, A. Raad and V. Vafeiadis. **The Path to Durable Linearizability.***  
Proc. ACM Program. Lang., POPL. 2023.
- POPL'23 *M. Sammler, S. Spies, Y. Song, E. D'Oswaldo, R. Krebbers, D. Garg, and D. Dreyer. **DimSum: A Decentralized Approach to Multi-language Semantics and Verification.***  
Proc. ACM Program. Lang., POPL. 2023.  
– [Distinguished Paper Award at POPL'23](#)
- OOPSLA'22 *E. D'Oswaldo, A. Farzan and D. Dreyer. **Proving Hypersafety Compositionally.***  
Proc. ACM Program. Lang. 6, OOPSLA2. 2022.
- OOPSLA'22 *D. Frumin, E. D'Oswaldo, B. van den Heuvel, and J. A. Pérez. **A Bunch of Sessions: A Propositions-as-Sessions Interpretation of Bunched Implications in Channel-Based Concurrency.*** Proc. ACM Program. Lang. 6, OOPSLA2. 2022.
- TOPLAS'21 *E. D'Oswaldo, J. Sutherland, A. Farzan and P. Gardner. **TaDA Live: Compositional Reasoning for Termination of Fine-grained Concurrent Programs.***  
In ACM Transactions on Programming Languages and Systems (TOPLAS). ACM. 2021.  
– Presented at POPL'22 (Journal-first submission).
- CONCUR'20 *E. D'Oswaldo, F. Stutz. **Decidable Inductive Invariants for Verification of Cryptographic Protocols with Unbounded Sessions.***  
In Proc. of Concurrency Theory. LIPIcs. 2020.
- CSF'17 *E. D'Oswaldo, L. Ong and A. Tiu. **Deciding Secrecy of Security Protocols for an Unbounded Number of Sessions: The Case of Depth-bounded Processes.***  
In Proc. of Computer Security Foundations. IEEE Computer Society. 2017.
- LICS'16 *E. D'Oswaldo, R. Meyer and G. Zetsche. **First-order Logic with Reachability for Infinite-State Systems.*** In Proc. of Symposium on Logic in Computer Science. ACM. 2016.
- ESOP'16 *E. D'Oswaldo, L. Ong. **On Hierarchical Communication Topologies in the  $\pi$ -calculus.*** In Proc. of European Symposium on Programming. Vol. 9632 of LNCS. Springer. 2016.
- SAS'13 *E. D'Oswaldo, J. Kochems and L. Ong. **Automatic Verification of Erlang-Style Concurrency.*** In Proc. of Static Analysis. Vol. 7935 of LNCS. Springer. 2013.
- AGERE'12 *E. D'Oswaldo, J. Kochems and L. Ong. **Soter: an Automatic Safety Verifier for Erlang,***  
In Proceedings of the 2nd edition on Programming systems, languages and applications based on actors, agents, and decentralized control abstractions. ACM. 2012.
- Monograph *E. D'Oswaldo. **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.

2016 **Lecturer** of Advanced Automata Theory, *TU Kaiserslautern*, Germany.

May–Jul 2015 **Teaching Assistant**, Concurrency Theory, *TU Kaiserslautern*, Germany.

Jun 2013–Mar 2014 **Tutor** at Merton College, *University of Oxford*, UK.

*Subjects* Concurrent Programming, Imperative Programming 2.

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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## Student supervision

2017–2022 Assistant Supervisor of **Julian Sutherland**, PhD in Computer Science, *Imperial College*.

*Topic* Compositional Termination Proofs of Fine-grained Concurrent Programs.

2019 **Felix Stutz**, MSc Computer Science, *Saarland University*, Germany.

*Topic* Automatic verification of cryptographic protocols through inductive invariants.

2019 **Ruhi Choudhury**, MEng Computing, *Imperial College London*.

2018 **Blaine Rogers**, MEng Joint Mathematics and Computing, *Imperial College London*.

*Thesis* A  $\pi$ -calculus Abstraction for Erlang .

– Winner of Davis Prize award (best JMC thesis).

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## Invited Talks

May 2022 Invited Talk at **Iris Worksoop 2022**, Radboud University, Nijmegen, The Netherlands.

*Topic* *TaDA Live: Compositional Termination Verification for Concurrent programs.*

May 2019 Talk at **Effective Verification: Static Analysis Meets Program Logics**, Lorentz Center, The Netherlands. Invitation-only research workshop.

*Topic* *Inductive Invariants for Automatic Verification of Cryptographic Protocols.*

Jan 2019 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.*

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## Academic Activities

**Program Committee** Erlang Workshop 2018/2021, EXPRESS/SOS 2019.

**Organisation** Local organiser for MFPC/CALCO 2019 in London.

<b>Reviewer</b>	OOPSLA 2020/2022/2023, ECOOP 2022/2023, CONCUR 2020, LMCS 2020, PLACES 2020,
<i>Conferences</i>	EXPRESS 2019, iFM 2019, ESOP 2019, CAV 2019, SAS 2018, PLDI 2018, CONCUR 2015/2017/2018/2020, ERLANG 2018/2021, FoSSaCS 2017, TACAS 2016, NETYS 2016/2021, MFCS 2012, LICS 2015, FSTTCS 2015, VMCAI 2014, DMC 2014, TAMC 2012, POPL 2012, TLCA 2011.
<i>Journals</i>	TCS, Information and Computation, Information and Software Technology, Mathematical Structures in Computer Science.
<i>Artifact Evaluation</i>	OOPSLA 2022/2023, ECOOP 2022/2023.
<i>Award Committee</i>	POPL Student Research Competition 2021 Selection Committee.

## Research Software

**Lemma9** A tool for automatically checking/inferring invariants of security protocols (with F. Stutz).

*Website* <http://github.com/bordaigor1/lemma9>

**Soter** A proof-of-concept static analyser for Erlang programs (with J. Kochems).

*Demo* <http://soter.emanueledosualdo.com/>

**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.
- University of Southern Denmark is using it in lectures.

## Other skills

**Languages** Italian (native speaker) · English (fluent)

**Programming** Python, JavaScript, Haskell, Scala, Java, Erlang.

**Music** Studied violin for more than ten years playing Classical and Jazz Music.  
Studied Musical Composition from 2000 to 2005 at the conservatory of Udine.