

Emanuele D'Oswaldo

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Current position

Apr 2024–present **Tenure-Track Professor**, Formal Methods for Software Engineering,
University of Konstanz, Germany.

Experience

- Sep 2020–Mar 2024 **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).
- 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.

Publications

- POPL'23 *E. D'Oswaldo, A. Raad and V. Vafeiadis. **The Path to Durable Linearizability.***
Proc. ACM Program. Lang. 7, 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. 7, 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 π -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.

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).

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 π -calculus Abstraction for Erlang.

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

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.*

Academic Activities

Chair Co-chair of the FORTE 24 Artifact Evaluation Committee.

Program Committee POPL 2024, CONCUR 2024, FORTE 2024, Erlang Workshop 2018/2021/2023, EXPRESS/SOS 2019.

Organisation Local organiser for MFPC/CALCO 2019 in London.

Reviewer OOPSLA 2020/2022/2023, ECOOP 2022/2023, CONCUR 2020, LMCS 2020, PLACES 2020,
Conferences 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.

Journals TCS, Information and Computation, Information and Software Technology,
Mathematical Structures in Computer Science.

Artifact Evaluation OOPSLA 2022/2023, ECOOP 2022/2023.

Award Committee 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 π -calculus

Website <http://github.com/bordaigor1/jamesbound>

- Includes an Haskell framework for analysing the π -calculus.

Stargazer An innovative, instructional, interactive execution environment for the π -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, Java, Haskell, working knowledge of Erlang, JavaScript, Scala.

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.