

# Burak Ekici, Ph.D.

Senior Research Associate at Department of Computer Science  
University of Oxford

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URL: <http://ekiciburak.github.io/>  
LANGUAGES: Turkish (native), English (operational), French (intermediate),  
Italian (intermediate), German (notions)

## WORK EXPERIENCE

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2023-NOW	Senior Research Associate – Department of Computer Science University of Oxford – Oxford, UK Topic: Multiparty Session Types Advisor: <a href="#">Nobuko Yoshida</a>
2022-NOW	Assistant Professor – Department of Computer Engineering Mugla Sıtkı Koçman University – Mugla, Turkey
2021-2022	Assistant Professor – Department of Computer Engineering TED University – Ankara, Turkey
2019-2020	Assistant Professor – Department of Computer Engineering Istanbul Kültür University – Istanbul, Turkey
2018-2019	Postdoctoral Researcher – Department of Computer Science University of Innsbruck, Innsbruck, Austria Topic: CoqHammer Advisor: <a href="#">Cezary Kaliszyk</a>
2016-2017	Postdoctoral Researcher – Department of Computer Science University of Iowa, Iowa, USA Topic: CVC4, SMTCoq Advisor: <a href="#">Cesare Tinelli</a>
2010-2011	Trainee Researcher – European Commission Joint Research Centre Ispra(VA), Italy Topic: Biometric Security Systems Advisor: Günter Schumacher

## EDUCATION

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2013-2015	PhD Degree in COMPUTER SCIENCE AND MATHEMATICS <i>Programming Language Semantics</i> , <b>Université Grenoble Alpes</b> – Grenoble, France Advisors: <a href="#">Jean-Guillaume Dumas</a> , <a href="#">Dominique Duval</a> , <a href="#">Damien Pous</a>
2009-2012	MSc Degree in COMPUTER ENGINEERING <i>Parallelization in Functional Programming</i> , <b>Yasar University</b> – Izmir, Turkey Advisor: <a href="#">Ahmet Hasan Koltuksuz</a>
2004-2009	BSc Degree in COMPUTER ENGINEERING <b>Izmir Institute of Technology</b> – Izmir, Turkey Advisor: <a href="#">Ahmet Hasan Koltuksuz</a>

## RESEARCH INTERESTS

Computational effects, categorical logic, type theory, Coq, functional programming, Haskell, OCaml, SMT, hammer systems, Multiparty session types.

## PUBLICATIONS AND ABSTRACTS

### Journals

- 2023 [A Sound Definitional Interpreter for a Simply Typed Functional Language](#)  
Axioms  
*Burak Ekici.*
- 2022 [Formal categorical reasoning](#)  
Turkish Journal of Mathematics  
*Burak Ekici.*
- 2020 [Mac Lane's Comparison Theorem for the Kleisli Construction Formalized in Coq](#)  
Mathematics in Computer Science  
*Burak Ekici and Cezary Kaliszyk.*
- 2018 [IMP with exceptions over decorated logic](#)  
Discrete Mathematics and Theoretical Computer Science  
*Burak Ekici.*

### Conferences

- 2024 [Completeness of Asynchronous Session Tree Subtyping in Coq](#)  
Fifteenth Conference on Interactive Theorem Proving (ITP)  
*Burak Ekici, Nobuko Yoshida.*
- 2023 [Formal Verification of Bit-vector Invertibility Conditions in Coq](#)  
The 14th International Symposium on Frontiers of Combining System (FroCoS)  
*Burak Ekici, Arjun Viswanathan, Yoni Zohar, Cesare Tinelli, and Clark Barrett.*
- 2019 [Verifying Bit-vector Invertibility Conditions in Coq \(Extended Abstract\)](#)  
Sixth Workshop on Proof eXchange for Theorem Proving (PxTP)  
Natal, Brazil, August 2019  
*Burak Ekici, Arjun Viswanathan, Yoni Zohar, Clark Barrett, and Cesare Tinelli.*
- 2018 [Concrete Semantics with Coq and CoqHammer](#)  
Proc. 11th Int. Conf. on Intelligent Computer Mathematics (CICM)  
Hagenberg, Austria, August 2018  
*Lukasz Czajka, Burak Ekici, Cezary Kaliszyk.*
- 2018 [Towards Mac Lane's Comparison Theorem for the \(co\)Kleisli Construction in Coq](#)  
Proc. of the 3rd Formal Mathematics for Mathematicians (FMM)  
Hagenberg, Austria, August 2018  
*Burak Ekici.*
- 2017 [SMTCoq: A plug-in for integrating SMT solvers into Coq](#)  
Proc. 29th Int. Conf. on Computer Aided Verification (CAV)  
Heidelberg, Germany, July 2017  
*Burak Ekici, Alain Mebsout, Cesare Tinelli, Chantal Keller, Guy Katz, Andrew Reynolds and Clark Barrett.*
- 2016 [Extending SMTCoq, a Certified Checker for SMT \(Extended Abstract\)](#)  
HaTT 2016: 1st International Workshop on Hammers for Type Theories  
Coimbra, Portugal, July 2016.

*Burak Ekici, Guy Katz, Chantal Keller, Alain Mebsout, Andrew Reynolds and Cesare Tinelli.*

- 2015 [Hilbert-Post completeness for the state and the exception effects](#)  
MACIS 2015: Sixth International Conference on Mathematical Aspects of Computer and Information Sciences, Berlin, Germany, 11–13 November 2015.  
Jean-Guillaume Dumas, Dominique Duval, *Burak Ekici*, Damien Pous and Jean-Claude Reynaud.
- 2014 [Certified proofs in programs involving exceptions](#)  
CICM 2014 : Eighth Conference on Intelligent Computer Mathematics  
Coimbra, Portugal, 7–11 July 2014, CEUR Workshop Proceedings, no 1186, paper 20.  
Jean-Guillaume Dumas, Dominique Duval, *Burak Ekici* and Jean-Claude Reynaud.
- 2014 [Formal verification in Coq of program properties involving the global state effect](#)  
JFLA 2014 : Journées Francophones des Langages Applicatifs, Fréjus, France, 8–11 January 2014  
Jean-Guillaume Dumas, Dominique Duval, *Burak Ekici* and Damien Pous
- 2010 [Implementations of Category Theory in Computer Science](#)  
9th National Mathematics Symposium, Karadeniz Technical University, October 2010.  
*Burak Ekici, Cagatay Yücel, Görkem Kılınç, Ahmet H. Koltuksuz.*
- 2010 [Implementation of Search Strategies in Control Network Programming](#)  
Procedural and Non-Procedural In: Proc. Intl. Symposium in Innovations in Intelligent Systems and Applications (INISTA 2010),  
June 2010, Kayseri, Turkey, 386-390.  
K. Kratchanov, E. Golemanova, T. Golemanov, T. Ercan, *B. Ekici.*

## Abstracts

- 2022 [Formal Categorical Reasoning](#),  
Studies on Scientific Developments in Geometry, Algebra, and Applied Mathematics,  
(Online Event) 1-3 February 2022.  
*Burak Ekici.*
- 2014 [Program certification with computational effects](#),  
Journées Nationales de Calcul Formel (JNCF) 2014, Marseille, France November 2014.  
Jean-Guillaume Dumas, Dominique Duval, *Burak Ekici* and Damien Pous.
- 2014 [Certification of programs with computational effects](#),  
Doctoral session. CICM 2014 : Eighth Conference on Intelligent Computer Mathematics,  
Coimbra, Portugal, 7–11 July 2014.  
*Burak Ekici.*

## TEACHING

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2022-2023	Main Course	Operating Systems (System programming in C)
2019-2020		
2022-2023	Main Course	Programming Language Concepts (OCaml, Coq)
2020-2023	Main Course	Formal Languages and Abstract Machines
2022-2023	Main Course	Functional Programming (Haskell, Coq)
2021-2022	Main Course	Category Theory in Computer Science (Coq)
2021-2022	Main Course	Fundamentals of Programming I (Java)

2019-2020	Main Course	Digital Design
2019-2020	Main Course	Microprocessors (x86)
2018-2019	Proseminar	Discrete Mathematics

## RECENT TALKS

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### Invited

- 08.03.2024    Decorated semantics for an imperative language with exceptions.  
Quantum Research Group, University of Oxford.
- 10.11.2023    SMTCoq – A Certified Checker for SMT.  
Mobility Reading Group, University of Oxford.
- 07.06.2019    [Univalent Typoids in Coq](#).  
Ludwig-Maximilians-Universität, Munich-Germany.
- 27.12.2018    Decorated semantics for an imperative language with exceptions.  
Özyegin University, Istanbul-Turkey.
- 10.11.2015    [Relative Hilbert-Post completeness for exceptions](#).  
Foundations Seminar, Ljubljana-Slovenia.

### Others

- 01.02.2022    Formal Categorical Reasoning.  
[Studies on Scientific Developments in Geometry, Algebra, and Applied Mathematics](#).
- 27.03.2019    Univalent Type Theory.  
Master Seminar, University of Innsbruck-Austria.
- 15.08.2018    [Concrete Semantics with Coq and CoqHammer](#).  
CICM'18 Hagenberg-Austria.
- 13.08.2018    [Towards Mac Lane's Comparison Theorem for the \(co\)Kleisli construction in Coq](#).  
FMM'18 Hagenberg-Austria.
- 31.05.2018    [SMTCoq, a plug-in for the trustworthy integration of SAT/SMT solvers into Coq](#).  
Master Seminar, University of Innsbruck-Austria.
- 03.06.2015    [IMP with exceptions over decorated logic](#).  
TFP'15, Sophia-Antipolis-France.
- 05.11.2014    [Program certification with computational effects](#).  
JNCF'14, Marseille-France.
- 11.07.2014    [Certification of programs with computational effects](#).  
CICM'14, Coimbra-Portugal.
- 09.01.2014    [Formal verification in Coq of program properties involving the global state effect](#).  
JFLA'2014, Fréjus - France.
- 05.12.2013    [Formal verification in Coq of program properties involving the global state effect](#).  
Séminaires LJK-Modèles et Algorithmes Déterministes: BIPOP-CASYS, Grenoble-France.

## EVENTS ATTENDED

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### Invited

- 07.06.2019 [Types in Munich](#) (invited by Dr. Iosif Petrakis),  
Ludwig-Maximilians-Universität, Munich-Germany.
- 09-13.11.15 University of Ljubljana (invited by Dr. Andrej Bauer),  
Ljubljana, Slovenia.

### Others

- 13-17.08.18 Conferences on Intelligent Computer Mathematics (CICM'18),  
Hagenberg-Austria.
- 25-30.03.18 3rd Conference on Artificial Intelligence and Theorem Proving (AITP'18),  
Aussois-France.
- 03-05.06.15 The Sixteenth Symposium on Trends in Functional Programming (TIFP'15),  
INRIA, Sophia-Antipolis-France.
- 26-29.05.15 Colloque Inter'Actions en Mathématiques 2015 (organization committee),  
Institut Fourier, Grenoble-France.
- 03-07.11.14 Journées Nationales de Calcul Formel (JNCF'14),  
CIRM, Marseille-France.
- 07-11.07.14 Conferences on Intelligent Computer Mathematics (CICM'14),  
Coimbra-Portugal.
- 07-18.04.14 PhD school on semantics of proofs and certified mathematics  
Institut Henri Poincaré, CIRM, Marseille-France.
- 07-11.01.14 JFLA: Journées Francophones des Langues Applicatifs,  
La-villa-clythia, Fréjus-France.
- 23-31.05.13 École Jeunes Chercheurs en Programmation,  
Inria, Rennes-France.

## CODE

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Please see my [github repository](#).

## MISCELLANEOUS

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Programming C/C++, Java, Haskell, OCaml, Coq, Lean.  
Libraries CRYMPIX, OpenMP, WHY3, SMTCoq, CoqHammer.

## REFEREES

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[Jean-Guillaume Dumas](#)  
LJK, University Grenoble Alpes  
[jean-guillaume.dumas@univ-grenoble-alpes.fr](mailto:jean-guillaume.dumas@univ-grenoble-alpes.fr)

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[Cesare Tinelli](#)  
Department of Computer Science,  
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[Cezary Kaliszyk](#)  
Computational Logic Group,  
University of Innsbruck  
[cezary.kaliszyk@uibk.ac.at](mailto:cezary.kaliszyk@uibk.ac.at)

Murat Taylı  
Department of Computer Engineering,  
Istanbul Kültür University  
[m.tayli@iku.edu.tr](mailto:m.tayli@iku.edu.tr)

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Department of Computer Science  
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