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

2023-NOW | Senior Research Associate – Department of Computer Science
University of Oxford – Oxford, UK
Topic: Multiparty Session Types
Advisor: Nobuko Yoshida

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: Cezary Kaliszyk

2016-2017 | Postdoctoral Researcher – Department of Computer Science
University of Iowa, Iowa, USA
Topic: CVC4, SMTCoq
Advisor: Cesare Tinelli

2010-2011 | Trainee Researcher – European Commission Joint Research Centre
Ispra(VA), Italy
Topic: Biometric Security Systems
Advisor: Günter Schumacher

EDUCATION

2013-2015 | PhD Degree in COMPUTER SCIENCE AND MATHEMATICS
Programming Language Semantics, **Université Grenoble Alpes** – Grenoble, France
Advisors: Jean-Guillaume Dumas, Dominique Duval, Damien Pous

2009-2012 | MSc Degree in COMPUTER ENGINEERING
Parallelization in Functional Programming, **Yasar University** – Izmir, Turkey
Advisor: Ahmet Hasan Koltuksuz

2004-2009 | BSc Degree in COMPUTER ENGINEERING
Izmir Institute of Technology – Izmir, Turkey
Advisor: Ahmet Hasan Koltuksuz

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

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 : Eigth 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-Cluaude 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 Novermber 2014.
Jean-Guillaume Dumas, Dominique Duval, *Burak Ekici* and Damien Pous.

2014 Certification of programs with computational effects,
Doctoral session. CICM 2014 : Eigth Conference on Intelligent Computer Mathematics,
Coimbra, Portugal, 7–11 July 2014.
Burak Ekici.

Teaching

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

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

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 Langages Applicatifs, La-villa-clythia, Fréjus-France.
23-31.05.13	École Jeunes Chercheurs en Programmation, Inria, Rennes-France.

Code

Please see my github repository.

Miscellaneous

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

Referees

Jean-Guillaume Dumas
LJK, University Grenoble Alpes
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Dominique Duval
LJK, University Grenoble Alpes
dominique.duval@univ-grenoble-alpes.fr

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The University of Iowa
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University of Innsbruck
cezary.kaliszyk@uibk.ac.at

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Department of Computer Engineering,
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