

# Burak Ekici, Ph.D.

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Languages: Turkish(native), English (operational), French(intermediate), Italian(intermediate), German (Notions)

## Education & Employment

- 2021-now Assistant Professor @ *Department of Computer Engineering, TED University, Ankara, Turkey.*
- 2019-2020 Assistant Professor @ *Department of Computer Engineering, İstanbul Kültür University, İstanbul, Turkey.*
- 2018-2019 Post-Doctoral Research Fellow @ *Department of Computer Science, University of Innsbruck, Innsbruck, Austria.*  
*Project: CoqHammer.*  
*Advisor: Cezary Kaliszyk.*  
*With: Łukasz Czajka.*
- 2016-2017 Post-Doctoral Research Fellow @ *Department of Computer Science, The University of Iowa, Iowa City-IA, USA.*  
*Project: Integrating CVC4 into SMTCoq.*  
*Advisor: Cesare Tinelli.*  
*With: Chantal Keller and Alain Mebsout.*
- 01.2013-12.2015 PhD Student @ *Department of Informatics, University Joseph Fourier, Grenoble-France.*  
*Thesis: Certification of programs with computational effects. [manuscript] [slides]*  
*Advisors: Jean-Guillaume Dumas, Dominique Duval, Damien Pous.*
- 2009-2012 MSc Student @ *Department of Computer Engineering, Yaşar University, Izmir-Turkey.*  
*Thesis: A parallelization approach to Haskell language through category theoretic implementations.*  
*Advisor: Ahmet H. Koltuksuz.*
- 2010-2011 Trainee Researcher @ *European Commission Joint Research Centre, Ispira(VA)-Italy.*  
*Project: Linearity detection of the growth effect on children fingertips.*  
*Advisor: Günter-Egon Schumacher.*
- 2004-2009 BSc Student @ *Department of Computer Engineering, Izmir Institute of Technology, Izmir-Turkey.*  
*Thesis: Parallelization of mathematical functions of a cryptographic and multiprecision library, Crympix.*  
*Advisor: Ahmet H. Koltuksuz.*  
*With: Görkem Kılınç and Çağatay Yücel.*

## Research Interests

Computational effects, categorical logic, type theory, Coq, SMT, hammer systems.

## Publications & Abstracts

### JOURNALS

2020

Burak Ekici, Cezary Kaliszyk. “[Mac Lane’s Comparison Theorem for the Kleisli Construction Formalized in Coq](#).” *Mathematics in Computer Science*, 2020.

2018 Burak Ekici. “[IMP with exceptions over decorated logic](#).” *Discrete Mathematics and Theoretical Computer Science* 20(2), 2018.

#### CONFERENCES

2019 Burak Ekici, Arjun Viswanathan, Yoni Zohar, Clark Barrett, and Cesare Tinelli. “[Verifying Bit-vector Invertibility Conditions in Coq \(Extended Abstract\)](#).” Sixth Workshop on Proof eXchange for Theorem Proving (PxTP). Natal, Brazil, August 2019.

2018 Łukasz Czajka, Burak Ekici, Cezary Kaliszyk. “[Concrete Semantics with Coq and CoqHammer](#).” Proc. 11th Int. Conf. on Intelligent Computer Mathematics (CICM). Hagenberg, Austria, August 2018.

2018 Burak Ekici. “[Towards Mac Lane’s Comparison Theorem for the \(co\)Kleisli Construction in Coq](#).” Proc. of the 3rd Formal Mathematics for Mathematicians (FMM), co-located with the 11th CICM. Hagenberg, Austria, August 2018.

2017 Burak Ekici, Alain Mebsout, Cesare Tinelli, Chantal Keller, Guy Katz, Andrew Reynolds and Clark Barrett. “[SMTCoq: A plug-in for integrating SMT solvers into Coq](#).” Proc. 29th Int. Conf. on Computer Aided Verification (CAV). Heidelberg, Germany, July 2017.

2016 Burak Ekici, Guy Katz, Chantal Keller, Alain Mebsout, Andrew Reynolds and Cesare Tinelli. “[Extending SMTCoq, a Certified Checker for SMT \(Extended Abstract\)](#).” *HaTT 2016: 1st International Workshop on Hammers for Type Theories, Coimbra, Portugal, July 2016*.

2015 Jean-Guillaume Dumas, Dominique Duval, Burak Ekici, Damien Pous and Jean-Claude Reynaud. “[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*.

2014 Jean-Guillaume Dumas, Dominique Duval, Burak Ekici and Jean-Claude Reynaud. “[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*.

2014 Jean-Guillaume Dumas, Dominique Duval, Burak Ekici and Damien Pous. “[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*.

2010 Burak Ekici, Çağatay Yücel, Görkem Kılınc, Ahmet H. Koltuksuz, “[Implementations of Category Theory in Computer Science](#).”, 9<sup>th</sup> National Mathematics Symposium, Karadeniz Technical University, October 2010.

2010 K. Kratchanov, E. Golemanova, T. Golemanov, T. Ercan, B. Ekici. “[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*.

#### ABSTRACTS

2014 Jean-Guillaume Dumas, Dominique Duval, Burak Ekici and Damien Pous. “[Program certification with computational effects](#).” *Journées Nationales de Calcul Formel (JNCF) 2014, Marseille, France November 2014*.

2014 Burak Ekici. “[Certification of programs with computational effects](#).” *Doctoral session. CICM 2014 : Eighth Conference on Intelligent Computer Mathematics, Coimbra, Portugal, 7–11 July 2014*.

## Teaching

2019-2020 Main Course: Digital Design @ İstanbul Kültür University.

2019-2020 Main Course: Microprocessors @ İstanbul Kültür University.

2019-2020 Main Course: Programming Languages @ İstanbul Kültür University.

2018-2019      Proseminar: Discrete Mathematics @ University of Innsbruck.

## Recent Talks

### INVITED

- 07.06.2019      [Univalent Typoids in Coq](#). Ludwig-Maximilians-Universität, Munich-Germany.
- 27.12.2018      Decorated semantics for an imperative language with exceptions. Özyeğin University, İstanbul-Turkey.
- 10.11.2015      [Relative Hilbert-Post completeness for exceptions](#). Foundations Seminar, Ljubljana-Slovenia.

### OTHERS

- 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 (member of the 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 by 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++, Haskell, OCaml, Coq, Lean.

Libraries: CRYMPIX, OpenMP, WHY3, SMTCoq, CoqHammer.

## Referees

[Jean-Guillaume Dumas](#)

LJK, University Grenoble Alpes

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[Dominique Duval](#)

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