

# Andrei Dan

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## PROFILE

I am a scientist in Internet of Things Systems & Software at Hitachi ABB Power Grids. Previously, I developed reliable and secure industrial software solutions and machine learning applications at ABB Corporate Research. During my PhD studies at ETH Zurich, I worked on static code analysis for software correctness and security.

## WORK EXPERIENCE

*Scientist in Internet of Things Systems & Software* 2020 -  
Hitachi ABB Power Grids Research, Baden-Dättwil

*Scientist in Software Security* 2018 - 2020  
ABB Corporate Research Center, Baden-Dättwil

- IoT [project](#) on connecting devices to distributed ledgers for industrial applications
- Improved security and privacy of applications using computation on encrypted data
- Evaluated and improved robustness of machine learning for industrial use cases
- Innovation [project](#) on easy robot programming using artificial intelligence

*Research Intern* 2016  
Samsung Research America, Mountain View, USA

- Proved that computing a Context-Free Language minimal cut is NP-hard
- Implemented a fix-location finder for a null-pointer analysis of Java programs

*Research Intern* 2011 - 2012  
IBM Research, Rüschlikon

- Implemented in C a Linux device driver for solid-state hybrid storage systems
- Explored trade-offs between performance and durability of the devices

*Research Intern* 2010  
SRI International, Menlo Park, USA

- Developed using the PVS proof system a verified SAT trace checker
- Increased the confidence in the results of highly-optimized SAT solvers

## EDUCATION

*Ph.D. Computer Science* 2012 - 2018  
Software Reliability Lab, ETH Zurich

- Thesis advisor: Prof. Martin Vechev
- Developed new static program analysis for concurrent programs running on multi-core processors or high performance networks, part of the [Fender](#) project
- Developed part of the [Securify](#) analyzer for the security of Ethereum smart contracts

*M.Sc Computer Science* 2010 - 2012  
Ecole Polytechnique Federale de Lausanne

- Fast-track Master program in Computer Science consisting of 90 ECTS credits

*Engineer Diploma* 2008 - 2010  
Ecole Polytechnique Paris, France

- Multidisciplinary scientific education, formal methods for software reliability

*B.Sc. Computer Science* 2005 - 2009  
Polytechnic University of Bucharest, Romania

- Final Project: Designed and implemented a GPS Navigator in Java

## PAPERS

*Synthesizing False Positive Adversarial Objects Using Generative Models*

M. Kotuliak, S.E. Schoenborn, A. Dan

**Submitted**

*Fast and Effective Robustness Certification for Recurrent Neural Networks*

W. Ryou, J. Chen, M. Balunovic, G. Singh, A. Dan, M. Vechev

**Submitted**

*Securify: Practical Security Analysis of Smart Contracts*

P. Tsankov, A. Dan, D. Drachler-Cohen, A. Gervais, F. Bunzli, M. Vechev

**CCS 2018**

*Automatic Verification of RMA Programs via Abstraction Extrapolation*

C. Baumann, A. Dan, Y. Meshman, T. Hoefler, M. Vechev

**VMCAI 2018**

*Finding Fix Locations for CFL-Reachability Analyses via Minimum Cuts*

A. Dan, M. Sridharan, S. Chandra, JB Jeannin, M. Vechev

**CAV 2017**

*Modeling and Analysis of Remote Memory Access Programming*

A. Dan, P. Lam, T. Hoefler, M. Vechev

**OOPSLA 2016**

*Effective Abstractions for Verification under Relaxed Memory Models*

A. Dan, Y. Meshman, M. Vechev, E. Yahav

**VMCAI 2015**

*Synthesis of Memory Fences via Refinement Propagation*

Y. Meshman, A. Dan, M. Vechev, E. Yahav

**SAS 2014**

*Predicate Abstraction for Relaxed Memory Models*

A. Dan, Y. Meshman, M. Vechev, E. Yahav

**SAS 2013**

## AWARDS

Distinguished Paper Award at OOPSLA 2016

ACM SIGPLAN Travel Grant for OOPSLA 2016

EPF Lausanne Excellence Scholarship 2010 - 2012

Eiffel Excellence Scholarship (French Ministry of Foreign Affairs) 2008 - 2010

## TEACHING ASSISTANT

*Program Analysis* 2013 - 2015

Graduate Course

*Software Architecture and Engineering* 2014 - 2018

Undergraduate Course

## SERVICE

*External Review Committee Member*

**ASPLOS 2020**

*Program Committee Member*

**EASE 2019**