

Kacper Bąk, Ph.D.

Curriculum Vitae

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Scottsdale, AZ, United States

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*Software Engineering Research and Advanced Development,
Blockchain, Security Audits*

Education

2009–2013 **Ph.D.**, *University of Waterloo*, Canada.

Computer Science, Adviser: Prof. Krzysztof Czarnecki, GPA: 91.38/100

Research in Software Engineering: Software Product Lines, Modeling Languages, Variability

2006–2009 **B.Sc.**, *Warsaw University of Technology*, Poland.

Computer Science, Adviser: Dr. Artur Krystosik, GPA: 4.75/5.00, *Summa Cum Laude*

Experience

2017–present **Senior Research Engineer**, *Engineering*, Quantstamp, San Francisco, CA, USA.

Activities:

Security Audits, building and leading the team responsible for performing manual and automated smart contract security audits; audit process design and improvements. Notable audits: Prismatic Eth 2.0, Cardano, Chainlink, OMG Plasma, Matic, Ampleforth, Pool Together, Atomic Loans, PieDAO, Binance BEP;

Smart Contract Scans, co-leading research, design, and development of protocol for performing automated security scans of smart contracts;

Other, improving internal processes, working with business development, auditor training, interviewing job candidates, interaction with external clients.

2013–2017 **Senior Software Engineer**, *Modeling Framework*, MathWorks, Natick, MA, USA.

Projects:

MF0, class-based modeling framework offering modeled services: associations management, model versioning, serialization, synchronization (between C++, MATLAB, and JavaScript implementations), transformations, traceability links, evolution, visualization, attribute maps;

Class Modeling, native support for associations management in MATLAB;

Clam, a web-based class modeling editor for MATLAB;

Dependency Viewer, a web-based dependency viewer for Simulink models;

Diagram Framework, framework for generating graph-based graphical editors.

2009–2013 **Research Assistant**, *GSD Lab*, University of Waterloo, Canada.

Projects:

Clafer, a unified language for modeling and analysis of variability in Software Product Lines; *Common Variability Language* (CVL), OMG proposal for a standard for specifying and resolving variability;

Example-Driven Modeling (EDM), an approach that systematically uses explicit examples for eliciting, modeling, verifying, and validating complex business knowledge.

Teaching Assistant, GSD Lab, University of Waterloo, Canada.

Courses:

Spring 2012, *Software Design and Architecture (SE 464)*, SE 464;

Fall 2011, *Design Project Planning (SE 390)*, SE 390;

Spring 2010, *Software Abstraction and Specification (CS 246SE)*, CS 246SE;

Winter 2010, *Compiler Construction (CS 444/644)*, CS 444/644;

Fall 2009, *Elementary Algorithm Design and Data Abstraction (CS 136)*, CS 136.

- Summer **Software Engineer**, *Opera Mini*, Opera Software, Linköping, Sweden.
2009 Development of mobile browser and user interface. Technologies: C++, Java and Bream (proprietary).
- Summer **Software Engineer**, *Opera Mini*, Opera Software, Linköping, Sweden.
2008 Compiler and virtual machine performance optimizations. Technologies: Java and Bream (proprietary).
- Summer **Software Quality Engineer**, *DTV Lab*, Samsung R&D Center, Warsaw, Poland.
2007 Development of a database application for classifying Digital TV streams. Technologies: C# and PHP.
- 2006–2008 **Software Engineer**, *SSESG*, Warsaw University of Technology, Poland.
Constructing software for on-board computer, communications, and distributed satellite testing.
Projects:
PW-Sat, the first Polish satellite;
ESEO, a micro-satellite mission within European Space Agency’s Education Satellite Program;
BOBAS2, a stratospheric balloon mission.

Awards

- 2011–2012 Ph.D. Fellowship, IBM Canada Centers for Advanced Studies Research
- 2010–2012 International Doctoral Student Award, University of Waterloo
David R. Cheriton Graduate Scholarship, University of Waterloo
- Winter 2010 UW Graduate Scholarship, University of Waterloo
- 2009–2010 Graduate Experience Award, University of Waterloo
International Masters Student Award, University of Waterloo
Graduate Entrance Scholarship, University of Waterloo
- 2007–2008 Academic Performance Award, Warsaw University of Technology

Publications

Michał Antkiewicz, **Kacper Bąk**, Krzysztof Czarnecki, Dina Zayan, Andrzej Wąsowski, and Zinovy Diskin. Example-Driven Modeling Using Clafer. In *MDEBE*, 2013.

Michał Antkiewicz, **Kacper Bąk**, Alexander Murashkin, Rafael Olaechea, Jimmy Liang, and Krzysztof Czarnecki. Clafer tools for product line engineering. In *SPLC*, 2013.

IBM, Thales, Fraunhofer FOKUS, and TCS. *Proposal for Common Variability Language (CVL) Revised Submission*, 2012.

Richard Ma, Jan Gorzny, Edward Zulkoski, **Kacper Bąk**, and Olga V. Mack. *Fundamentals of Smart Contract Security*. Momentum press, 2019.

Kacper Bąk. Certificateless cryptography. BSc Thesis, Warsaw University of Technology, 2009.

Kacper Bąk. *Modeling and Analysis of Software Product Line Variability in Clafer.* PhD thesis, University of Waterloo, 2013.

Kacper Bąk, Krzysztof Czarnecki, and Andrzej Wąsowski. Feature and Class Models in Clafer: Mixed, Specialized, and Coupled. Technical Report CS-2010-10, University of Waterloo, 2010.

Kacper Bąk, Krzysztof Czarnecki, and Andrzej Wąsowski. Feature and Meta-Models in Clafer: Mixed, Specialized, and Coupled. In *SLE*, 2010.

Kacper Bąk, Zinovy Diskin, Michał Antkiewicz, Krzysztof Czarnecki, and Andrzej Wąsowski. Partial Instances via Subclassing. In *SLE*, 2013.

Kacper Bąk, Zinovy Diskin, Michał Antkiewicz, Krzysztof Czarnecki, and Andrzej Wąsowski. Clafer: Unifying Class and Feature Modeling. In *SOSYM*, 2014.

Kacper Bąk, Dina Zayan, Krzysztof Czarnecki, Michał Antkiewicz, Zinovy Diskin, Andrzej Wąsowski, and Derek Rayside. Example-Driven Modeling. Model = Abstractions + Examples. In *ICSE*, 2013.

Speaking

- 2018 CPC Crypto DevCon
World Crypto Economic Forum
- 2017 International Summer School on Domain-Specific Modeling Theory and Practice
- 2013 Dagstuhl Seminar on Analysis, Test and Verification in The Presence of Variability
- 2011 Dagstuhl Seminar on Feature-Oriented Software Development (FOSD)

Academic Service

- Co-reviewer Theoretical Computer Science
IEEE Transactions on Software Engineering
SCP special issue on Software Evolution, Variability and Adaptability
Applications of Graph Transformations with Industrial Relevance
International Conference on Software Engineering
International Conference on Software Language Engineering
International Software Product Line Conference
International Conference on Model Transformation
International Conference on Generative Programming and Component Engineering
ACM/IEEE International Conference on Model Driven Engineering Languages and Systems
IEEE/ACM International Conference on Automated Software Engineering
European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering
International Workshop on Variability Modelling of Software-intensive Systems
Workshop on Domain-Specific Modeling
International Workshop on Modeling in Software Engineering

Languages

- Polish Native

English Fluent
Portuguese Basic

Computer Languages

Programming C, C++, Java, JavaScript, C#, Assembler, Haskell, Scheme, ML, Prolog
Other \LaTeX , SQL, Solidity, Vyper

Modeling UML, OCL, MOF, MOFM2T, CVL, MATLAB, Alloy, Clafer, K