

# Kacper Bał, Ph.D.

## Curriculum Vitae

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### Software Engineering Research and Advanced Development

## 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

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

Design and development of meta-modeling infrastructure and graphical editors. Technologies: C++, MATLAB, UML, OCL, MOFM2T, JavaScript, Alloy

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

Projects:

*Clafar*, 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 Developer**, *Opera Mini*, Opera Software, Linköping, Sweden.

2009 Development of mobile browser and user interface. Technologies: C++, Java and Bream (proprietary).

Summer **Software Developer**, *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.

Spring 2007 **Functional Programming Evangelist**, Warsaw University of Technology, Poland.  
Co-organization of *Seminar in Functional Programming*. Supervised by Dr. Andrzej Zalewski.

2006–2008 **Software Developer**, 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.

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## 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

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## 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.

**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.

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## Speaking

- 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)

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## 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

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## Graduate Courses

- CS 744 **Advanced Compiler Design.**  
Project: Optimized Translation of Clafer Models to Alloy
- CS 846 **Topics in Software Evolution and Empirical Studies.**  
Project: Software Product Line Evolution: the Linux Kernel
- CS 746 **Software Architecture.**  
Project: Exemplar of Automotive Architecture with Variability
- CS 889 **Open Source Usability.**  
Project: Improving Usability of the Linux Kernel Configuration Tools
- CS 886 **Persuasive Technologies.**  
Project: Modeling Variation Space of Tailored Messages
- CS 846 **Model-Based Software Engineering.**  
Project: Clafer: a Unified Language for Class and Feature Modeling
- CS 798 **Interpreters for Functional Languages.**  
Project: Interpreter for FSML: Detecting Framework Concepts in Source Code Through Reverse-Engineering
- CS 745 **Computer-Aided Verification.**

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## Languages

- Polish **Native**
- English **Fluent**
- Portuguese **Basic**

## Computer Languages

Programming	C, C++, Java, JavaScript, C#, Assembler, Haskell, Scheme, ML, Prolog	Modeling	UML, OCL, MOF, MOFM2T, CVL, MATLAB, Alloy, Clafer
Other	L <sup>A</sup> T <sub>E</sub> X, SQL		