

# Ed Zulkoski

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Software engineer and developer with a strong educational background in both computer science and mathematics. Capable of working on challenging problems independently while effectively meeting the needs of the team.

## Education

2008–2012 **B.S.**, Wilkes University, Pennsylvania, USA.  
*Mathematics and Computer Science*, Adviser: Dr. Fred Sullivan  
GPA – 3.86/4.00, *Summa Cum Laude*

2012–Present **Ph.D. Student**, University of Waterloo, Ontario, Canada.  
*Computer Science*, Advisers: Vijay Ganesh and Krzysztof Czarnecki  
GPA – 92.6/100  
Research Focus: Applications and extensions of SAT/SMT

## Experience

2012–Present **Research Assistant**, GSD LAB, University of Waterloo.  
*Supervisors*: Vijay Ganesh and Krzysztof Czarnecki  
Publications available upon request.  
Projects:

- *ClafersMT*. Designed, implemented, and tested a full translation of the relational-logic modeling language *Clafers* to the Z3 SMT solver. Implemented in Python.
- *Improved arithmetic in Kodkod*. Incorporated formula-rewrite techniques into the constraint solver Kodkod for improved performance. Required extensive modification to a medium-sized Java project.
- *MathCheck*. Designed and implemented a constraint programming system that combines SAT solvers with computer-algebra systems. Extended known results on two conjectures related to hypercubes.

2008–2012 **Senior Systems Administrator**, MATH/CS DEPT., Wilkes University.  
*Supervisor*: Dr. Fred Sullivan  
*Overview*: Maintained computer labs (Linux, Mac, Windows) and Linux servers.

Summer **Research Intern**, Microsoft Research.

2016 *Supervisor*: Dr. Christoph Wintersteiger  
*Overview*: Lifted the notion of SAT solving backdoors to the SMT bit-vector domain.

## Awards

2014–Present Ph.D. Fellowship, IBM Canada Centers for Advanced Studies Research  
May 2012 Outstanding Graduate of the College of Science & Engineering, Wilkes University  
May 2012 Outstanding Graduate in Computer Science, Wilkes University  
May 2012 James Decosmo Memorial Mathematics Award, Wilkes University  
May 2012 Scholar-Athlete of the Year, Wilkes University

## Computer Languages & Skill Areas

Experienced	PYTHON, JAVA	Logic	SMT, SAT, Z3, ALLOY
Basic	ANDROID, HASKELL, C++, C	Other	Linux, BASH, SAGE