

# Alex (Oleksandr) Polozov

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## EDUCATION

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- Ph.D. in Computer Science** 2012-2017 (expected)  
**M.S. in Computer Science** 2012-2015  
*University of Washington, Seattle, USA*  
Advisors: Dr. Sumit Gulwani & Prof. Zoran Popović  
Ph.D. Thesis: “A Framework for Inductive Program Synthesis with Industrial Data Wrangling Applications”
- B.Math. in System Analysis** 2008-2012  
*National Technical University of Ukraine “Kyiv Polytechnic Institute”*  
Advisor: Prof. Yury Tymoshenko  
Thesis: “Structure and Term Prediction for Mathematical Text”

## PUBLICATIONS

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- [1] R. Rolim, G. Soares, L. D’Antoni, O. Polozov, S. Gulwani, R. Gheyi, R. Suzuki, and B. Hartmann, “Learning syntactic program transformations from examples,” in *39th International Conference on Software Engineering (ICSE)*, To appear, 2017.
- [2] O. Polozov and S. Gulwani, “Program synthesis in the industrial world: inductive, incremental, interactive,” in *5th Workshop on Program Synthesis (SYNT)*, 2016.
- [3] M. Mayer, G. Soares, M. Grechkin, V. Le, M. Marron, O. Polozov, R. Singh, B. Zorn, and S. Gulwani, “User interaction models for disambiguation in programming by example,” in *ACM Symposium on User Interface Software and Technology (UIST)*, 2015.
- [4] O. Polozov and S. Gulwani, “FlashMeta: a framework for inductive program synthesis,” in *ACM Conference on Object-Oriented Programming Systems, Languages, and Applications (OOPSLA)*, 2015.
- [5] O. Polozov, E. O’Rourke, A. M. Smith, L. Zettlemoyer, S. Gulwani, and Z. Popović, “Personalized mathematical word problem generation,” in *International Joint Conference on Artificial Intelligence (IJCAI)*, 2015.
- [6] O. Polozov and S. Gulwani, “LaSEWeb: automating search strategies over semi-structured web data,” in *ACM Conference on Knowledge Discovery and Data Mining (KDD)*, 2014.

## Preprints & Tech Reports

- [1] O. Polozov, S. Gulwani, and S. Rajamani, “Structure and term prediction for mathematical text,” Tech. Rep. MSR-TR-2012-7, Tech. Rep., 2012.

## PROFESSIONAL EXPERIENCE

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**Software Development & Research Contractor** October 2014 – present  
*Populus Group at Microsoft, Redmond, USA*

A founding member of the [Program Synthesis using Examples \(PROSE\)](#) R&D team at Microsoft Data Group. Working on the framework for automatic synthesis of data wrangling scripts from incomplete specs (input-output examples, constraints, demonstrations). Its applications are deployed in multiple Microsoft products:

- FlashFill: string transformations by example in Excel,
- ConvertFrom-String and Convert-String cmdlets in PowerShell,
- Text extraction in Azure Operational Management Suite,
- Web & email processing in Exchange and Cortana.

I am working closely with a team of 10+ researchers and engineers at Microsoft Research and Microsoft Data Group concurrently with completing my Ph.D.

**Research Intern**

March 2014 – September 2014

*Microsoft Research, Redmond, USA*

Designed and developed a modular algorithmic framework for automatic synthesis of programs in domain-specific languages from inductive specifications. Generalizes 5 years of prior work in programming by examples done by the Sumit Gulwani's group and collaborators. This work became a foundation for the Microsoft PROSE team (see above).

**Research Intern**

June 2013 – September 2013

*Microsoft Research, Redmond, USA*

Designed a declarative language and an efficient interpreter for designing search strategies for microsegment queries based on linguistic predicates and semi-structured data on the Web.

**Research Intern**

June 2012 – September 2012

*Microsoft Research, Redmond, USA*

Developed a language and an algorithm for 2D data visualization by example and data extraction from semi-structured images.

**Software Development & Research Practice Intern**

November 2011 – May 2012

*Yandex, Kyiv, Ukraine*

Built a dictionary-based morphological engine with inflection prediction and disambiguation for Russian, Ukrainian, and English.

**Software Development Intern**

June 2011 – September 2011

*Microsoft, Redmond, USA***Team:** Office Labs

Built a home/work location prediction with further exploration of user scenarios in a digital assistant project with mobile user interface. Technologies: Windows Phone, WCF, Silverlight.

**SKILLS**


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<i>Programming Technologies</i>	C#, C/C++, Python, Wolfram Mathematica, Java, Scala, F#, AnsProlog, TypeScript
<i>Theory</i>	<ul style="list-style-type: none"> <li>• Programming languages, software engineering, program synthesis</li> <li>• Answer set programming, SAT/SMT solving, formal logic</li> <li>• Natural language processing: morphology, reference resolution, language generation</li> </ul>
<i>Languages</i>	English (fluent), Russian (native), Ukrainian (native)

**TEACHING EXPERIENCE****CSEP 590C: Domain-Specific Languages**

Spring 2016

*Teaching Assistant & Lecturer*

Together with Prof. Ras Bodik and Pavel Panchekha, we co-designed and taught a “Professional Masters” evening course on domain-specific languages. Audience: professional software engineers with multiple years of industry experience. Course content includes foundations of compiler/interpreter development, a collection of well-known DSLs (D3.js, Mustache, Hadoop, React.js, Rx), basics of program synthesis in PROSE, and lessons on DSL design.

**Functional Programming**

2011 – 2012

*Lecturer*

Self-designed and self-taught optional 2-semester course for undergraduate Applied Math students.

Covered basic FP concepts, parallel programming with monoids and MapReduce, purely functional data structures, monads and typeclasses, lambda calculus.

**Algorithms and Data Structures**

2009 – 2012

*ACM ICPC lecturer & team coach*

Taught advanced algorithms and data structures for undergraduate ACM ICPC teams, with focus on performance and programming competitions.