

Chenglong Wang

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CSE2 380
University of Washington, Seattle

RESEARCH MISSION

- To democratize programming, especially to empower data scientists, social scientists, natural scientists, journalists, digital designers, and other non-professional programmers to achieve more. To achieve this goal, I build program synthesis powered tools that can solve programming tasks by synthesizing programs from examples, user demonstrations, and other partial task specifications.

AREAS OF SPECIALIZATION

- Programming Languages, Program Synthesis, Human-Computer Interaction, Data Visualization, Neuro-Symbolic Program Synthesis

EDUCATION

- **Ph.D. Candidate in Computer Science and Engineering (09/2015 - Expected 06/2021)**
Advisors: Ras Bodik, Alvin Cheung
Paul G. Allen School of Computer Science & Engineering, University of Washington.
- **B.S. in Computer Science (09/2011 - 07/2015)**
Advisors: Yingfei Xiong, Zhenjiang Hu
School of Electronics Engineering and Computer Science, Peking University, China

EXPERIENCES

- **Deepmind, Research Intern (07/2018 - 12/2018)**
Mentor: Pushmeet Kohli (Deep Learning Team)
- **Microsoft Research, Research Intern (06/2017 - 09/2017)**
Mentor: Rishabh Singh (Cognition Group)
- **Microsoft Research, Research Intern (06/2016 - 09/2016)**
Mentors: Kris Ganjam, Yeye He (DMX Lab)
- **Carnegie Mellon University, Undergraduate Research Intern (06/2014 - 09/2014)**
Mentor: Jonathan Aldrich

SYNTHESIS-POWERED PROGRAMMING TOOLS

- **Falx** A synthesis-powered data visualization tool. Demonstrate how to visualize a few data points in a dataset; Falx synthesizes programs to transform and visualize the full dataset.
<https://falx.cs.washington.edu/>
- **Cosette** An automated SQL solver. Provide two SQL queries; Cosette proves their equivalence or finds a distinguishing input to show their difference if possible.
<https://cosette.cs.washington.edu/>
- **Draco** A visualization recommendation engine. Provide a partial visualization specification; Draco recommends best visualizations based on its design principles encoded as logic rules.
<https://uwdata.github.io/draco/>
- **Scythe** A highly expressive SQL query synthesizer. Demonstrate the task using small input-output example tables; Scythe synthesizes SQL queries for querying full database.
<https://scythe.cs.washington.edu/>

CONFERENCE PAPERS

- Falx: Synthesis-powered Visualization Authoring (CHI 2021, conditionally accepted)
Chenglong Wang, Yu Feng, Rastislav Bodik, Isil Dillig, Alvin Cheung, Amy J. Ko
- Program Synthesis using Deduction-Guided Reinforcement Learning (CAV 2020)
Yanju Chen, Chenglong Wang, Osbert Bastani, Isil Dillig, Yu Feng
- Scout: Rapid Exploration of Interface Layout Alternatives through High-Level Design Constraints (CHI 2020)
Amanda Swearngin, Chenglong Wang, Alannah Oleson, James Fogarty, Amy J. Ko.
- Visualization By Example (POPL 2020)
Chenglong Wang, Yu Feng, Ras Bodik, Alvin Cheung, Isil Dillig.
- Learning Transferable Graph Exploration (NeurIPS 2019)
Hanjun Dai, Yujia Li, Chenglong Wang, Rishabh Singh, Po-Sen Huang, Pushmeet Kohli
- Knowing When to Stop: Evaluation and Verification of Conformity to Output-size Specs (CVPR 2019)
Chenglong Wang, Rudy Bunel, Krishnamurthy Dvijotham, Po-Sen Huang, Edward Grefenstette, Pushmeet Kohli
- Speeding up Symbolic Reasoning for Relational Queries (OOPSLA 2018)
Chenglong Wang, Alvin Cheung, Ras Bodik
- Formalizing Visualization Design Knowledge as Constraints: Actionable and Extensible Models in Draco (InfoVis 2018, **Best Paper Award**)
Dominik Moritz, Chenglong Wang, Greg L. Nelson, Halden Lin, Adam M. Smith, Bill Howe, Jeffrey Heer
- NL2Bash: A Corpus and Semantic Parser for Natural Language Interface to the Linux Operating System (LREC 2018)
Xi Victoria Lin, Chenglong Wang, Luke Zettlemoyer, Michael D. Ernst
- Synthesizing Highly Expressive SQL Queries From Input-Output Examples (PLDI 2017)
Chenglong Wang, Alvin Cheung, Ras Bodik
- Cosette: An Automated SQL Solver (CIDR 2017)
Shumo Chu, Chenglong Wang, Konstantin Weitz, Alvin Cheung
- Patl: Program Transformation between APIs with Many to Many Mappings (ECOOP 2016)
Chenglong Wang, Jiajun Jiang, Jun Li, Yingfei Xiong, Xiangyu Luo, Zhenjiang Hu

SHORT PAPERS

- Testing query execution engines with mutations (DBTest 2020)
Xinyue Chen, Chenglong Wang, Alvin Cheung
- Natural Language to Structured Query Generation via Meta-Learning (NAACL 2018)
Po-Sen Huang, Chenglong Wang, Rishabh Singh, Wen-tau Yih, Xiaodong He
- Execution-Guided Neural Program Decoding (NAMPI 2018)
Chenglong Wang, Po-Sen Huang, Alex Polozov, Marc Brockschmidt, Rishabh Singh
- Demonstration of the Cosette Automated SQL Prover (SIGMOD Demo 2017, **Best Demo Award**)
Shumo Chu, Daniel Li, Chenglong Wang, Alvin Cheung, Dan Suciu
- Interactive Query Synthesis from Input-Output Examples (SIGMOD Demo 2017)
Chenglong Wang, Alvin Cheung, Rastislav Bodik
- Composable and Hygienic Typed Syntax Macros (SAC 2015)
Cyrus Omar, Chenglong Wang, Jonathan Aldrich
- SWIN: Towards Type-Safe Java Program Adaptation between APIs (PEPM 2015)
Jun Li, Chenglong Wang, Yingfei Xiong, Zhenjiang Hu

AWARDS

- InfoVis 2018 Best paper Award
- SIGMOD 2017 Best Demo Award

TEACHING

- Teaching Assistant, CSE 507, Computer Aided Reasoning for Software
University of Washington (2019 Spring)

ACADEMIC SERVICE

- OOPSLA 2020 Conference (External Reviewer)
- IntEx-SemPar 2020 Workshop (Program Committee)
- LREC 2020 Conference (Scientific Committee)
- IPA 2020 Workshop (Program Committee)
- Pacific Vis 2019 Conference (External Reviewer)

DEPARTMENT SERVICE

- Graduate Admissions Committee, University of Washington 2017–2020
- Prospective Student Committee, Co-Chair, University of Washington 2017
- Prospective Student Committee, University of Washington 2017–2018

REFERENCES

- Ras Bodik, Professor
Paul G. Allen School of Computer Science & Engineering, University of Washington, Seattle
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- Alvin Cheung, Assistant Professor
Department of Electrical Engineering and Computer Sciences, University of California, Berkeley
akcheung@cs.berkeley.edu
- Amy J. Ko, Professor
The Information School, University of Washington, Seattle
ajko@uw.edu
- Isil Dillig, Associate Professor
Department of Computer Science, University of Texas, Austin
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