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 Uiversity, China

EXPREIENCES

- **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

- 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
  bodik@cs.washington.edu
- 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
  isil@cs.utexas.edu