

Werner M. Dietl

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Student Project Supervision

Projects at the University of Waterloo

The MASc program is a 24 month, full-time research degree. The student works on a research project and finishes with a thesis. Funding is provided by the supervisor(s).

Undergraduate Research Assistantship (URA) undergraduates work about 6-8 hours/week for a term on a research project. Undergraduate Student Research Award (USRA) and Undergraduate Research Internship (URI) undergraduates work full-time for a term on a research project.

Current Students

- [UWatC1] Yuliia Nortman. Design and Implementation of a Type System for Enhanced Mathematical Operations in Rings. PhD exchange student (ongoing). May 2024.
- [UWatC2] Haibo Sun. JSpecify Conformance Test Improvements. Spring 2024 URA student (ongoing). May 2024.
- [UWatC3] Charlie Cao. Nullness Checker Test Suite Improvements. Spring 2024 undergraduate volunteer (ongoing). May 2024.
- [UWatC4] Thomas Kirz. Optional type systems for database queries. MASc student (ongoing) now at TU Wien; collaboration with Prof. Scherzinger, University of Passau, and Mattias Ulbrich, KIT. June 2023.
- [UWatC5] Aosen Xiong. Pluggable Type Systems (TBD). PhD student (ongoing). January 2023.
- [UWatC6] Florian Lanzinger. Property Type Systems. Visiting PhD student (September to November 2022); PhD student at KIT, supervised by Mattias Ulbrich; previously MASc student, co-advised with Mattias Ulbrich, KIT (May 2020 to February 2021). May 2020.
- [UWatC7] Wolfram Pfeifer. Improved Abstractions for Deductive Proofs. PhD student (ongoing) at KIT, supervised by Mattias Ulbrich. June 2023.
- [UWatC8] Mark S. Dittmer. Object Capability Systems (TBD). PhD student (ongoing); co-supervised with Mahesh V. Tripunitara. January 2021.

Graduate Students

- [UWatM1] Haifeng Shi. Context-Sensitive Optional Type Systems Meet Generics: A Uniform Treatment and Formalization. MASc student (started January 2022). December 2023.
- [UWatM2] Alex Liu. A Lightweight Type System with Uniqueness and Tpestates for the Java Cryptography API. MASc student (started January 2022). August 2023.
- [UWatM3] Zhiping Cai. UniFlow: A CFG-Based Framework for Pluggable Type Checking and Type Inference. MASc student (started May 2021); previously Winter 2020 URA student working on Checker Framework Inference Improvements (January to April 2020). April 2023.
- [UWatM4] Piyush Jha. OppropBERT: An Extensible Graph Neural Network and BERT-style Reinforcement Learning-based Type Inference System. MASc student (started May 2021). December 2022.
- [UWatM5] Negar Sabour. Static Verification of 5G-AKA. MASc student (started January 2022); co-supervised with Mahesh V. Tripunitara. April 2023.

- [UWatM6] Di Wang. Interval Type Inference: Improvements and Evaluations. MASc student (started May 2020). December 2021.
- [UWatM7] Lian Sun. An Immutability Type System for Classes and Objects: Improvements, Experiments, and Comparisons. MASc student (started September 2019). Previously MEng student assistant in Spring 2019. April 2021.
- [UWatM8] Weitian Xing. Light-weight verification of cryptographic API usage. MASc student (started May 2019). Previously MEng student assistant in Winter 2019. December 2020.
- [UWatM9] Puneet Gill. Least-Privilege Identity-Based Policies for Lambda Functions in Amazon Web Services (AWS). MASc student (started January 2019); co-supervised with Mahesh V. Tripunitara. December 2020.
- [UWatM10] Jenny (Tongtong) Xiang. Type Checking and Whole-program Inference for Value Range Analysis. MASc student (started May 2018). Spring 2019: Internship at Amazon Web Services in Seattle, USA. October 2020.
- [UWatM11] Jeff Luo. Pluggable Type Systems. PhD student (started July 2014, incomplete). Spring 2016 and Spring 2017: Internships at Google, Waterloo, Canada. Mr. Luo was awarded scholarships, including two Queen Elizabeth II Graduate Scholarships in Science & Technology, and awards for his excellent teaching efforts. On leave January to December 2019, terminated PhD program in December 2019. Now at Google. December 2019.
- [UWatM12] Daniel Gerald Caccamo. GoA — Actors with Locally Managed Memory for Go. MASc student (started September 2016). Spring 2017: Internship at Amazon, Seattle, USA. Now at IBM, Ottawa, Canada. December 2018.
- [UWatM13] Charles Zhuo Chen. Pluggable Properties for Program Understanding: Ontic Type Checking and Inference. MASc student (started January 2016). Winter 2017: Internship at Amazon, Toronto, Canada. Now a full-time employee there. April 2018.
- [UWatM14] Mier Ta. Context Sensitive Typechecking And Inference: Ownership And Immutability. MASc student (started January 2016). Winter 2017: Internship at Amazon, Vancouver, Canada. Now a full-time employee at Amazon, Toronto, Canada. April 2018.
- [UWatM15] Sadaf Tajik. Pluggable Type Systems. MASc student (started September 2017, not finished). April 2018.
- [UWatM16] Jason Jianchu Li. A General Pluggable Type Inference Framework and its use for Data-flow Analysis. MASc student (started May 2015). Spring 2016: Internship at Blackberry, Waterloo, Canada. Now at Amazon, Vancouver, Canada. April 2017.
- [UWatM17] Yameng Li. Pluggable Type Systems. MEng student volunteer (started May 2016). July 2016.
- [UWatM18] Dan Brotherston. Gradual Pluggable Typing in Java. MMath student (started May 2014); co-supervised with Ondřej Lhoták. Now at TL Innovation Lab, Waterloo, Canada. April 2016.
- [UWatM19] Nahid Juma. Complexity Analysis of Tunable Static Inference For Generic Universe Types. MASc student (started July 2014); co-supervised with Mahesh V. Tripunitara. August 2015.

Undergraduate Students

- [UWatU1] Emily Tao. Avoiding bytecode storage for optional type systems. Winter 2024 URA student (started January 2024). April 2024.

- [UWatU2] Rohan Shetty. JSpecify conformance tests for the EISOP Nullness Checker. Winter 2024 URA student (started January 2024). April 2024.
- [UWatU3] Omer Adeel. Build system integration improvements. Winter 2024 URA student (started January 2024). April 2024.
- [UWatU4] Shaheer Hasan. Basic support for SARIF file format. Winter 2024 URA student (started January 2024). April 2024.
- [UWatU5] Nicholas Chew. Improved nullness analysis in the ECF language server. Fall 2023 URA student (started September 2023). December 2023.
- [UWatU6] Zain Salman. Integrate type system knowledge into the ECF language server. Fall 2023 URA student (started September 2023). December 2023.
- [UWatU7] Luc Antony Lorand Edes. Automatically generating a website from GitHub releases. Winter 2023 URA student (started January 2023). April 2023.
- [UWatU8] Farzan Mirshekari. Interactive CFG visualization. Winter 2023 URA student (started January 2023). April 2023.
- [UWatU9] Tony Sun. JSpecify nullness specification and checker. Winter 2023 URA student (started January 2023). April 2023.
- [UWatU10] Padena Rasouli-Baghban. Upgraded Live Demo Website. Fall 2022 URA student (started September 2022). December 2022.
- [UWatU11] Daniel Zhu. Build support for multiple Java versions. Fall 2022 URA student (started September 2022). December 2022.
- [UWatU12] Kaihang Jiang. Website generation tool. Spring 2022 URA student (started May 2022). August 2022.
- [UWatU13] Javier Rodriguez. Test case generation tool. Spring 2022 URA student (started May 2022). August 2022.
- [UWatU14] Yumeng Chen. Preprocessing for multi-release JAR files. Winter 2022 URA student (started January 2022). April 2022.
- [UWatU15] Jing Liu. Multi-release JAR files for compiler plug-ins. Fall 2021 URA student (started September 2021). December 2021.
- [UWatU16] Evette Madeline Chan-Lee. VSCode Annotated Type Visualization. Spring 2021 URA student (started May 2021). August 2021.
- [UWatU17] Andrew Guo. Benchmarking and Improving Value Inference. Spring 2021 URA student (started May 2021). August 2021.
- [UWatU18] Jainish Mehta. Live Demo Website Improvements. Winter 2021 URA student (started January 2021). April 2021.
- [UWatU19] Willa Kong. Type Inference Live Demo Website. Winter 2021 URA student (started January 2021). April 2021.
- [UWatU20] Frank Ding. Type Inference Benchmarks. Fall 2020 URA student (started September 2020). December 2020.
- [UWatU21] Leo Liu. Improving Viewpoint Adaptation Test Coverage. Spring 2020 URA student (started May 2020). August 2020.

- [UWatU22] Shiji Liu. Checker Framework IDE Integration. Spring 2020 URA student (started May 2020). August 2020.
- [UWatU23] Hejia Wang. Checker Framework Eclipse Integration. Winter 2020 URA student (started January 2020). April 2020.
- [UWatU24] Yuanhui Cheng. Correct Usage of Cryptographic APIs. Winter 2020 URA student (started January 2020). April 2020.
- [UWatU25] Ahmad Tahir Chaudhry. Checker Framework Live Demo Website Improvements. Winter 2020 student volunteer (started January 2020). April 2020.
- [UWatU26] Michael Xiheng Jiang. Checker Framework Eclipse Integration. Fall 2019 URA student (started September 2019). December 2019.
- [UWatU27] Nhat Nguyen. Performance of Static Analysis Systems. Fall 2019 CS 499R student (started September 2019). December 2019.
- [UWatU28] Baorui Zhou. Pluggable Type System Formalizations. Winter 2019 URI student, Fall 2018 URA student, Spring 2018 URI student. April 2019.
- [UWatU29] Jerry Huang. Checker Framework Inference Web Demo. Fall 2018 URA student (started September 2018). December 2018.
- [UWatU30] Sunjay Varma. Gauss-Jordan Constraint Solver. Fall 2018 URA student (started September 2018). December 2018.
- [UWatU31] Yiren Zhou. Checker Framework Atom Integration. Fall 2018 URA student (started September 2018). December 2018.
- [UWatU32] Adam Yifan Yang. Checker Framework LSP Integration. Spring 2018 URA student (started May 2018). August 2018.
- [UWatU33] Amanda Yuxin Jiang. Checker Framework VSCode Integration. Winter 2018 URA student (started January 2018). April 2018.
- [UWatU34] Haaris Ahmed. Checker Framework IDE Integration. Fall 2017 URA student (started September 2017). December 2017.
- [UWatU35] Boying (Ashley) Liu. Checker Framework Live Demo Improvements. Spring 2017 URA student (started May 2017). August 2017.
- [UWatU36] Vic Hao-Chien Lin. Benchmark infrastructure and Web Interface. Spring 2017 USRA student (started May 2017). August 2017.
- [UWatU37] Andy Chang Ho Lee. Investigate a new Pluggable Type System. Fall 2016 URA student (started September 2016). December 2016.
- [UWatU38] Fernando Peña. Checker Framework Rise4Fun Integration. Fall 2016 URA student (started September 2016). December 2016.
- [UWatU39] Luqman Aden. Checker Framework Inference Improvements. Fall 2016 USRA student (started September 2016). Now at Microsoft, Redmond, USA. December 2016.
- [UWatU40] Matthew D'Souza. Checker Framework Java 9 Update. Fall 2016 URA student (started September 2016). December 2016.
- [UWatU41] Steven Jia. Checker Framework IntelliJ Integration. Fall 2016 URA student (started September 2016). December 2016.

- [UWatU42] Thomas Feng. Checker Framework Performance Improvements. Fall 2016 student volunteer (started September 2016). December 2016.
- [UWatU43] Tony Rong Tan Wang. Checker Framework NetBeans Integration. Fall 2016 URA student (started September 2016). December 2016.
- [UWatU44] Shruti Dembla. Checker Framework Performance Profiling. Winter 2016 URA student (started January 2016). May 2016.

Other Projects

- [UWatO1] Yuyan Bao. Type systems for Program Verification. Post-Doctoral researcher (started January 2021); co-supervised with Arie Gurfinkel. Now an Assistant Professor at Augusta University. December 2022.
- [UWatO2] Fady Abousifein. Project documentation and improvements. Spring 2022 high school volunteer (started May 2022). August 2022.
- [UWatO3] Seung Whan (Peter) Song. Project documentation and improvements. Fall 2021/Winter 2022 high school volunteer (started September 2021). June 2022.
- [UWatO4] Aditya Singh. General Tainting Checker. Spring 2020 GSoC student (started May 2020). Google Summer of Code (GSoC) is a competitive intern funding program from Google. Dr. Dietl is one of the GSoC organizers for the Checker Framework project and is the GSoC advisor for Mr. Singh. September 2020.
- [UWatO5] Jiangqi Zhang. Checker Framework LSP Server. ECE 699 and MEng student assistant (started January 2019). December 2019.
- [UWatO6] Ayush Agarwal. Android Support Annotations. Spring 2019 GSoC student (started April 2019). Google Summer of Code (GSoC) is a competitive intern funding program from Google. Dr. Dietl is one of the GSoC organizers for the Checker Framework project and was the GSoC advisor for Mr. Agarwal. August 2019.
- [UWatO7] Ravi Roshan. Checker Framework Java 9 support. Spring 2018 GSoC student (started April 2018). Google Summer of Code (GSoC) is a competitive intern funding program from Google. Dr. Dietl is one of the GSoC organizers for the Checker Framework project and was the GSoC advisor for Mr. Roshan. August 2018.
- [UWatO8] Shinya Yoshida. Control Flow Graph Enhancements. Spring 2017 GSoC student (started April 2017). Google Summer of Code (GSoC) is a competitive intern funding program from Google. Dr. Dietl is one of the GSoC organizers for the Checker Framework project and was the GSoC advisor for Mr. Yoshida. August 2017.

External PhD Thesis Reader

1. Paley Li, March 2015, Victoria University of Wellington

PhD Defense Committee Member

1. Hari Govind Vediramana Krishnan, June 2024, ECE, University of Waterloo
2. Parsa Pourali, January 2020, ECE, University of Waterloo
3. Marianna Rapoport, November 2019, CS, University of Waterloo
4. Aaron Moss, April 2019, CS, University of Waterloo

5. Jonathan Eyolfson, April 2018, ECE, University of Waterloo
6. Pansy Arafa, May 2017, ECE, University of Waterloo
7. Karim Ali, September 2014, CS, University of Waterloo

PhD Comprehensive Exam Committee Member

1. Yusen Su, December 2022, ECE, University of Waterloo
2. Yiwen Dong, December 2021, CS, University of Waterloo
3. Hari Govind Vediramana Krishnan, November 2021, ECE, University of Waterloo
4. Parsa Pourali, April 2017, ECE, University of Waterloo
5. Pansy Arafa, June 2015, ECE, University of Waterloo
6. Jean-Christophe Petkovich, July 2014, ECE, University of Waterloo
7. Jonathan Rodriguez, July 2014, CS, University of Waterloo
8. Jonathan Eyolfson, May 2014, ECE, University of Waterloo

PhD Background Exam Committee Member

1. Hetong Dai, June 2024, ECE, University of Waterloo
2. Yuanjie Xia, May 2024, ECE, University of Waterloo
3. Joseph Tafese, April 2024, ECE, University of Waterloo
4. Siddharth Priya, December 2022, ECE, University of Waterloo
5. Indrani Ray, December 2022, ECE, University of Waterloo
6. Yusen Su, August 2021, ECE, University of Waterloo
7. Hari Govind Vediramana Krishnan, August 2020, ECE, University of Waterloo

Master Thesis Reader

1. Yekta Demirci, January 2022, MASc, ECE, University of Waterloo
2. Tejvinder Singh Toor, January 2022, MASc, ECE, University of Waterloo
3. Rahul Punchhi, August 2021, MASc, ECE, University of Waterloo
4. Yangtian Zi, August 2021, MMath, CS, University of Waterloo
5. Siddharth Priya, August 2021, MASc, ECE, University of Waterloo
6. Boyun Zhang, December 2020, MASc, ECE, University of Waterloo
7. Jakub Kuderski, August 2019, MASc, ECE, University of Waterloo
8. Alex Norton, August 2019, MMath, CS, University of Waterloo
9. Ming-Ho Yee, September 2016, MMath, CS, University of Waterloo
10. Michael Chong, July 2016, MASc, ECE, University of Waterloo
11. Taiyue Liu, July 2016, MASc, ECE, University of Waterloo
12. Omar Alghamdi, November 2015, MASc, ECE, University of Waterloo
13. Aymen Ketata, September 2015, MASc, ECE, University of Waterloo
14. Neeraj Kumar, July 2015, MMath, CS, University of Waterloo
15. Zhuoran Yin, April 2015, MASc, ECE, University of Waterloo

16. Matthew Ma, July 2014, MAsc, ECE, University of Waterloo
17. Marianna Rapoport, July 2014, MMath, CS, University of Waterloo

ECE 499 Final Project Report Reader

1. Chuhan Xiang, Winter 2024

Fourth Year Design Project Supervision at the University of Waterloo

1. “Kitchen Buddies”, Spring 2022, Winter 2023
2. “PhysioConnect”, Spring 2022, Winter 2023
3. “LegalRelief: Crowdfunded Legal Fees”, Spring 2021, Winter 2022
4. “DAAK: Smart Mail Recipient”, Spring 2019, Winter 2020
5. “Seat Spotter (app that finds free spots in the library)”, Spring 2015, Winter 2016
6. “Real Time Instant Messaging System”, Spring 2014, Winter 2015

Projects at the University of Washington

- [UWash1] Konstantin Weitz. String format type system. PhD student (started February 2013). Now at Google, California, USA. October 2013.
- [UWash2] Eric Reed. Units-of-Measurement type system. PhD student (started September 2012). October 2013.
- [UWash3] Stuart A. Pernsteiner. Qualifier polymorphic type systems. PhD student (started September 2012). October 2013.
- [UWash4] Philip Lai. SPARTA: case studies and extensions. Undergraduate research (started June 2012). Now at Indeed.com. October 2013.
- [UWash5] Tyler Rigsby. Verification games: extended type systems; game generation. Undergraduate research (started March 2012). Now at Google, California, USA. October 2013.
- [UWash6] Nathaniel Mote. Verification games: graph description and layout; game generation. Undergraduate research (started January 2011). Now at Facebook, Washington, USA. October 2013.
- [UWash7] Brian Walker. Verification games: website integration. Undergraduate research (started January 2012). Now at Google, California, USA. January 2013.
- [UWash8] Stefan Heule. Improved dataflow analysis for the Checker Framework. Undergraduate and Master’s research (started September 2011). Now at Google, California, USA. July 2013.
- [UWash9] Dimitrios C. Gklezacos, Stefan Heule, and Brandon Holt. Evaluating Practical Non-Null Type Systems for Java. CSE 503 course project. December 2011.
- [UWash10] Mark Davis. Fake enumerations and nullness type checker case study on the OpenJDK javac. Undergraduate research (started July 2011). July 2012.
- [UWash11] Eric Spishak. Fake enumerations and regular expression type checker case studies and extensions; verification games: annotation and cast handling. Undergraduate and Master’s research (started April 2011). Now at Google, California, USA. April 2013.

[UWash12] Stephanie Dietzel. Interning type checker case studies; verification games: KeyFor integration; testing framework. Undergraduate and Master's research (started July 2011). Now at Tableau Software. April 2013.

[UWash13] Andreas Abel, Kivanc Muslu, and Brandon Myers. Dataflow support for the Checker Framework. CSE 501 course project. December 2010.

Master's projects at ETH Zurich

Master's projects are six month full-time projects.

[EM1] Manfred Stock. Implementing a Universe Type Checker in Scala. Master's thesis. January 2008.

[EM2] Mathias Ottiger. Runtime Support for Generics and Transfer in Universe Types. Master's thesis, co-supervised with A. Rudich. August 2007.

[EM3] Robin Züger. Generic Universe Types in JML. Master's thesis. July 2007.

[EM4] Andreas Furer. Combining Runtime and Static Universe Type Inference. Master's thesis. March 2007.

[EM5] Martin Klebermaß. An Isabelle Formalization of the Universe Type System. Master's thesis, co-supervised with Prof. T. Nipkow, T. U. München. April 2007.

[EM6] Daniel Schreggenberger. Universe Type System for Scala. Master's thesis. June 2007.

[EM7] Matthias Niklaus. Static Universe Type Inference using a SAT-Solver. Master's thesis. June 2006.

[EM8] Marco Bär. Practical Runtime Universe Type Inference. Master's thesis. May 2006.

[EM9] Stefan Nägeli. Ownership in Design Patterns. Master's thesis. March 2006.

[EM10] Nathalie Kellenberger. Static Universe Type Inference. Master's thesis. October 2005.

[EM11] Frank Lyner. Runtime Universe Type Inference. Master's thesis. July 2005.

[EM12] Thomas Hächler. Applying the Universe Type System to an Industrial Application. Master's thesis. March 2005.

Semester projects at ETH Zurich

Semester projects have a workload of around 160 hours.

[ES1] Phokham Nonava. A Universe Type Checker using JSR308. Semester project. September 2008.

[ES2] Timur Erdag. Visualizer for Universe Type Inference Information. Semester project. September 2007.

[ES3] Dominique Schneider. Testing Tool for Compilers. Semester project. March 2007.

[ES4] Annetta Schaad. Universe Type System for Eiffel. Semester project. October 2006.

[ES5] Ovidio Mallo. MultiJava, JML, and Generics. Semester project. October 2006.

[ES6] Paolo Bazzi. Integration of Universe Type System Tools into Eclipse. Semester project. October 2006.

[ES7] David Graf. Implementing Purity and Side Effect Analysis for Java Programs. Semester project. March 2006.

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- [ES8] Marco Meyer. Interaction with Ownership Graphs. Semester project. March 2006.
 - [ES9] Dirk Wellenzohn. Implementation of a Universe type checker in ESC/Java2. Semester project. October 2005.
 - [ES10] Alex Suzuki. Bytecode support for the Universe type system and compiler. Semester project. March 2005.
 - [ES11] Thomas Hächler. Static Fields in the Universe Type System. Semester project. July 2004.
 - [ES12] Daniel Schreggenberger. Dynamic Typechecking in the Universe Type System. Semester project. October 2004.
 - [ES13] Yann Müller. Testcases for the Universe type system compiler. Project assistant. September 2004.