Xiang Chen

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Education

- **Master of Mathematics, Computer Science**
  University of Waterloo, Waterloo, Canada *Sep 2020 - Expected Aug 2022*
- **Honors Bachelor of Science, Computer Science** - GPA: 3.8/4.0
  York University, Toronto, Canada *2017 - 2020*
- **Ontario College Advanced Diploma, Computer Systems Technology** - GPA: 4.0/4.0
  Seneca College, Toronto, Canada *2015 - 2016*
- **Honors Bachelor of Economics, International Economics and Trade**
  Guangzhou University of Chinese Medicine, Guangzhou, China *2008 - 2012*

Scholarship

- Lassonde Undergraduate Research Award (LURA): *$8,000* *May 2020 - Aug 2020*
- York University Continuing Student Scholarship: *based on academic merit* *Sep 2018*

Technical Skills

- **Languages:** Java, Python, Prolog, C, Shell Programming, Javascript, LaTeX, HTML, MatLab, Eiffel (Design by Contract), Verilog
- **Tools:** Antlr 4 (Parser Generator Tool), Z3 SMT Solver, Eclipse, SWI-Prolog, PyCharm, Android Studio

Projects

- **Building an Automated Verifier for a Procedural Programming Language**
  Software Engineering Project, York University *Jan 2020 - Apr 2020*
  - Supervisor: Jackie Wang
  - Final grade: A+
  - Extended project of previous project that involves a series of extensions:
    * Addition of linear data structures (e.g., array, pair, as well as their combinations).
    * Extension to the proposition/predicate language to include constructs of a procedural programming language, including: variable assignments, sequential composition, conditionals, loops, routines, and contractual specification (preconditions, postconditions, and class invariants).
    * The automated transformation of each routine into a **Hoare Triple** that can either be proved as a tautology or disproved via counterexamples. The process of (automatically) proving the Hoare Triples also involves the systematic calculation of the **weakest precondition** of every routine, given its implementation and postcondition.
  - Project GitHub: https://github.com/echo-xiangchen/EECS4080
  - Presentation Recording: https://youtu.be/7RtcP-6Lffk

- **Building an Automated Verifier for Propositional and Predicate Logic**
  Software Engineering Project, York University *Aug 2019 - Dec 2019*
  - Supervisor: Jackie Wang
  - Final grade: A+
  - Use context-free grammar and the **Antlr tool** to specify an expression language supporting the writing of propositions, predicates, and simple data structures (e.g., lists).
  - Implement a series of transformation rules (as **Java** methods using Visitor Design Pattern), which will return runtime abstract syntax tree (AST) based on any input text conforming to the language grammar.
  - Turn the abstract syntax tree (AST) into the equivalent encoding in **Z3 SMT Solver** for verification.

- Develop a complete set of tests, both at the unit level (i.e., individual transformation rules) and at the acceptance level (i.e., end-to-end verification).
- Users of this verification tool can easily check if a valid propositional or predicate formula is a tautology, or receive a counterexample otherwise.
- Project GitHub: https://github.com/echo-xiangchen/EECS4080
- Presentation Recording: https://youtu.be/LHthLnmz6Bo

- **Battleship Game Project**
  Eiffel ETF and Software Engineering Project, York University *Jan 2019 - Apr 2019*
  - Use **Eiffel** ETF framework to develop a text-based UI battleship game, including the features supporting normal game mode, debug game mode, and some extra operations (e.g., undo/redo, reset, give-up).
  - Design the structure with information hiding principle, modularity, abstraction and separation of concerns.
  - Develop a series of regression tests and a formal report including a clear design structure using BON diagram.

Employment Experience

- **Teaching Assistant** of course EECS 1022: Programming for Mobile Computing *Winter 19, Summer 19*
  - Lead TA sessions 3 hours a week, and grade lab assignments.
  - Assist professor and help students with their labs (using Java, developing Android Apps).
  - Deepen students' understanding of Java by explain simple concepts and algorithms to them.

- **Government Officer**
  Government of Yayao, Guangzhou, China *Aug 2013 – Dec 2014*
  - Effectively manage the Collective Management Trading Platform through updating, monitoring and preserving data quality.
  - Maintaine the hardware and software of office computers, which helps me generate the interest of computers.
  - Involve in writing the web page of the Collective Management Trading Platform as well as a simple Windows program that could access and review the information on the platform.

- **Assistant** of Dr. Nanshan, Zhong (Academician of Chinese Academy of Engineering)
  Guangzhou Respiratory Institute, Guangzhou, China *Aug 2012 – Jul 2013*
  - Develop the proposal for the cooperation of Nanshan Medical Development Foundation and Mr. Zhenyu, Huo, and make meeting summaries.
  - Involve in the research of Investigation on the physical health of Macao adolescents, attend the meeting in Macao Institution for Applied Research in Medicine and Health (MIAR), and generate the progress report as well as meeting summaries, also help drafting the final paper.
  - Organize the annual meeting of Guangdong Medical Association in 2012, and create the formal report.