Yuchong Pan

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Education

- **Massachusetts Institute of Technology** — Cambridge, MA
  Ph.D., Applied Mathematics (GPA: 5.0/5.0) — *September 2021 – present*
  - **Research Interests**: Algorithms, combinatorics, optimization, theoretical computer science, operations research, network flow algorithms, traveling salesman problem
- **University of British Columbia** — Vancouver, BC
  B.Sc., Combined Honours Computer Science and Mathematics (GPA: 94.4%) — *September 2017 – May 2021*
  - **Thesis**: *Optimization Problems on Network Flows with Degree Constraints*, advised by F. Bruce Shepherd [Link]

Selected Employment

- **Massachusetts Institute of Technology** — Cambridge, MA
  Mentor — *January 2022 – February 2022*
  - **Directed Reading Program**: Mentoring two undergraduate students to read *Randomized Algorithms* by Motwani and Raghavan. Advising the students on the presentations in the program symposium.
- **University of British Columbia** — Vancouver, BC
  Research Assistant — *April 2021 – August 2021*
  - **Cost and Congestion of Exotic Network Flows**: Studied new network flow models with side constraints imposed by new telecommunication technologies (e.g., IP routing, optical networks, etc.). This research assistantship is partially funded by a Work Learn International Undergraduate Research Award.
- **Microsoft** — Vancouver, BC
  Software Engineer Intern — *May 2020 – August 2020*
  - **.NET Runtime IL Interpreter**: Resurrected the IL (intermediate language) interpreter inside .NET Runtime. Conducted performance analyses for the various configurations of the IL interpreter. [GitHub] [Presentation]
- **Microsoft** — Redmond, WA
  Software Engineer Intern — *June 2019 – August 2019*
  - **.NET Core Uninstall Tool**: A guided tool that enables the controlled clean-up of a system such that only the desired versions of .NET Core SDKs and Runtimes remain. [GitHub] [Blog] [Documentation]
  - **MSBuild Binary Log Query Language**: A domain-specific language extending XPath (XML Path Language) that provides multiple search operators for advanced queries on the target graph parsed from MSBuild binary logs.

Selected Projects

- **Gradual Typing of Recursive Types**: Applied abstract gradual typing to recursive types to obtain static and dynamic semantics for gradual typing, enabling programming languages to combine dynamic and static checking.
- **Gradual Octave**: Extended the Octave programming language with a gradual type system, incorporating benefits of both static and dynamic type systems. [Report] [GitHub]
- **MiniJava Compiler**: MiniJava is a subset of the Java language. Implemented a MiniJava-to-x64 compiler, including phases of frontend, intermediate representation, code generation, and optimization.

Selected Awards

- **Work Learn International Undergraduate Research Award** *2021*
- **Stanley M Grant Scholarship in Mathematics, University of British Columbia** *2019, 2021*
- **Faculty of Science International Student Scholarship, University of British Columbia** *2018, 2019, 2020*
- **Trek Excellence Scholarship, University of British Columbia** *2018, 2019, 2020*
- **Science Scholar / Dean's Honour List, University of British Columbia** *2018, 2019, 2020*
- **11th Place, ACM International Collegiate Programming Contest Pacific NW Region** *2017*
- **Outstanding International Student Award, University of British Columbia** *2017*
- **Silver Medal, China Team Selection Competition for International Olympiad in Informatics** *2015*
- **Bronze Medal, Asia Pacific Informatics Olympiad** *2015*
- **First Prize, National Olympiad in Informatics in Provinces** *2013, 2014*

Programming Skills

- **Languages**: C++, Python, Java, C#, SQL, MATLAB, Go, JavaScript, LaTeX