

# Zhiyi Pan

+1 (734) 881 5522  
✉ zhiyipan@umich.edu  
📄 pper.github.io  
🌐 PPER

## Education

- 2019-2020 **Bachelor**, *Computer Science Engineering*, University of Michigan, 3.84.  
Dual Degree Program  
Selected coursework: Advanced Compilers(graduate based); Program Synthesis(graduate based); Introduction to Operating Systems; Compiler Construction; Programming Languages
- 2017-2019 **Bachelor**, *Electrical and Computer Engineering*, Shanghai Jiaotong University, 3.55.

## Research Interests

Programming languages, compiler and software engineering

## Research

- Nov. 2019 - present **Research Assistant**, *prof. Cyrus Omar*, University of Michigan, Future of Programming Lab, Ann Arbor.  
Programming Language  
◦ Worked on a paper for a gradual bidirectional typing inference system - type hole inference.  
◦ Developed undo/redo and history recording features for Hazel, a live functional programming environment featuring typed holes.  
◦ Designed and implemented a history panel, which was used for EECS 490 teaching work in UM.
- May 2020 - **Research Assistant**, *prof. Scott Mahlke*, University of Michigan.  
July 2020 Compiler Optimization  
◦ Learnt and wrote optimization path by LLVM.  
◦ Implemented genetic algorithm to find optimized combination of flags for gcc.

## Academic Experience

- 2020 Fall **Teaching Assistant**, *EECS 490 Programming Languages*, University of Michigan.  
◦ 79-student upper level technical elective course.  
◦ Duties including holding office hours and lab teaching every week.
- August 2020 **Author**, *ICFP 2020*, Student Research Competition Track.  
Type Hole Inference  
◦ Won bronze medal in the student research competition.  
◦ Submitted an extended abstract, *Type Hole Inference*.  
◦ Participated in the poster session and communicated with ICFPers.  
◦ Made a presentation on the final talk session.

## Projects

- 2020 Fall **Programming Synthesis for Web Data Extraction**, *EECS 598 Program Synthesis: Techniques and Applications*, UM.  
Built a tool that synthesizes programs extracting data from user provided examples and web documents.  
◦ Defined a domain specific language and wrote a parser for DSL.  
◦ Used enumeration and refinement to synthesize programs that can filter out DOM nodes which satisfies specifications.

- 2019 Winter **Compiler for Decaf**, *EECS 483 Compiler Construction*, UM.  
 Implemented and optimized a compiler for Decaf (a strongly-typed, object-oriented language with support for inheritance and encapsulation), written in C++ and compiled Decaf program into MIPS assembly program.
- o Implemented a full-stack compiler from lexical analyzing to code generation with clear static, link and run-time error reporting.
  - o Optimized compiler by register allocation improvement, dead code elimination, constant folding, subexpression elimination, constant propagation and forward copy propagation.
- 2019 Winter **Network File System**, *EECS 482 Operating System*, UM.  
 Implemented a file system featuring encryption, authentication, failure tolerance and concurrency.
- February **Online Visual Novel**, *SJTU Network and Information Organization*, Shanghai.
- 2019 - May  
 2019 Implemented a visual novel featuring multiple story lines and endings, shopping store, archiving, achievement, HP systems.
- o Designed and built front-end pages (Html/Css/Js).
  - o Developed the back-end by Django, created database model and deployed it in the cloud server (Ubuntu).
  - o Revised it into a light framework and released on github.

## Awards

- August 2020 **Bronze**, *ICFP 2020 Student Research Competition*.
- April 2019 **Champion**, *12th Annual VEX U Robot Skills Challenge World Championship*, The Robotics Education & Competition Foundation, Louisville.  
 Over 30,000 people including more than 1,650 teams from 40 nations participated.
- o Designed and constructed over 5 versions of robots for competitions with other 8 teammates.
  - o Wrote daily work log and engineering sheets for the team.
- April 2019 **Second Place**, *12th Annual VEX U Robot World Championship*, The Robotics Education & Competition Foundation, Louisville.
- February 2019 **Champion**, *VEX Robotics Asia Open*, Ningbo, Zhejiang.
- November 2018 **Robot Awards**, *Summer Design Expo Best Technology Award*, UM-SJTU JI, Shanghai.  
 Built a remote-controlled glass wall cleaning robot
- 2017-2018 **Scholarship**, *Undergraduate Excellent Scholarship*, Shanghai Jiao Tong University, Shanghai.

## Programming Languages

- Functional OCaml, ReasonML
- Imperative C, C++
- Scripting Python, Javascript, Shell
- Others LaTeX, HTML/CSS, Matlab, Mathematica