AYAKA YORIHIRO

ay436@cornell.edu

EDUCATION

Cornell University   *September 2020 - Present*
Ph.D. in Computer Science.

Swarthmore College   *September 2016 - May 2020*
B.A. in Computer Science and Music.
Elected Phi Beta Kappa.

PROFESSIONAL EXPERIENCE

Research Assistant   *Fall 2019*
Swarthmore College Computer Science Department, Swarthmore, PA.
- Studying and developing an implementation of LCL-reachability approximation [Zhang, Su. POPL 2017] with intent to apply technique to additional program analyses.

Research Assistant   *Spring 2019, Summer 2019*
Swarthmore College Computer Science Department, Swarthmore, PA.
- Developed theory and implementation of *Plume*, a family of program analyses allowing the use of an experimental set-based context model.
- Performed a comparative study on set-based context models and size-k list-based context models and their precision on functional programs.
- Performed a comparative study on the precision of state-of-the-art program analyses (e.g. [Ali, Bodden, Späth. POPL 2019]) on analyzing programs with dynamic data and control flow.
- Paper to be submitted to ECOOP 2020.

C++ Engineering Intern   *Summer 2018*
Electronic Arts, Orlando, FL.

Intern, Sustainability Offices   *Summer 2017*
PwC Japan, Tokyo, Japan.

RELEVANT COURSES

Programming Languages
- Built an interpreter for a toy functional programming language.
- Studied and wrote proofs of formal operational semantics, type systems, and soundness.

Theory of Computation
- Proof-based course on studying Finite Automata, Pushdown Automata, Nondeterminism, and Turing Machines. [*Introduction to the Theory of Computation*, Sipser.]

Compilers
- Studied and built compilers for a basic functional programming language with garbage collection.

Algorithms
- Proof-based course on algorithm design, analysis, and implementation. [*Algorithm Design*, Kleinberg and Tardos.]

Computer Networks
- Hands-on study on large-scale distributed systems, i.e. the internet. [*Computer Networking: A Top-Down Approach*, Kurose and Ross.]

- Designed and implemented protocols and their specifications.

Modern Algebra I
- Proof-based, writing-intensive course studying the fundamentals of group theory, ring theory, and field theory. [*Contemporary Abstract Algebra*, Gallian.]
- Weekly problem sessions involve presentation of problems and their proofs.

Logic
- Introductory course to the principles of deductive logic with emphasis on syntax and semantics of logical systems. [*Elementary Symbolic Logic*, Gustaston and Ulrich.]

ACADEMIC WORK EXPERIENCE - SWARTHMORE COLLEGE

Teaching Assistant for Programming Languages *Spring 2020*
- Assisted students and graded work for lab assignments consisting of OCaml programming, Logic Proofs, building an Interpreter for a functional programming language, Operational Semantics, and Type Theory proofs.

Teaching Assistant for Theory of Computation *Spring 2020*
- Assisted students in solving in-class practice problems on topics in Automata Theory, Computability Theory and Complexity Theory.

Grader for Algorithms *Fall 2019*
- Reading students' designed algorithms and their proofs of correctness and time complexity.

Grader for Introduction to Computer Systems *Spring 2018, Spring 2019, Fall 2019*
- Evaluating students' lab assignments consisting of C programming, IA32 programming, circuit design, programming with concurrent processes and threads.

Student Representative, Faculty Candidate Search Committee *Spring 2019*
Swarthmore College Computer Science Department, Swarthmore, PA.
- Attended job talks and mock classes for each candidate, helped recruit student participation in interview activities, and gathered student feedback about candidates.

Student Mentor for Introduction to Computer Science *Fall 2018*
- Assisted students' learning of introductory computer science through python programming.

Grader for Data Structures and Algorithms *Fall 2017*
- Evaluated students' lab assignments consisting of C++ programming, implementations of data structures, induction proofs, and time complexity proofs.

Student Musician *Fall 2016 – Fall 2018*
Swarthmore College Music Department, Swarthmore, PA.

Language Tutor *Fall 2017 – Fall 2018*
Swarthmore College Japanese Department, Swarthmore, PA.

SKILLS AND INTERESTS

Programming Languages	OCaml, Python, C/C++, LaTeX
Languages	English (Fluent), Japanese (Fluent)
Interests and Activities	Viola, Orchestra, Chamber Music, Special Needs

EXTRA-CURRICULAR

Co-President of Kizuna (Japanese Culture Appreciation Club) *Fall 2017 – Spring 2019*
Organized on-campus and off-campus events, led group discussions.

Event Coordinator of Global Neighbors *Fall 2016 – Spring 2018*
(Club supporting those with special needs)
Attended weekly board meetings to discuss future steps and organizing events. Additionally, facilitated a panel about diversity and inclusion focusing on special needs.

Piano Quartet *Spring 2017 – Spring 2018*

Viola Lessons *Fall 2016 – Current*

Swarthmore College Orchestra *Fall 2016 – Current*