Joseph Reeves

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809 College Street Apt. 19, 15232 Pittsburgh PA

EDUCATION

PhD Fall 2020, expected graduation Fall 2025

Carnegie Mellon University, PA, Department of Computer Science
PhD advisors Marijn Heule and Randal Bryant
NDSEG Fellow, entering Fall 2022
Proposed Thesis: Cardinality Constraints in Satisfiability Solving
Focus: Automated Reasoning, Satisfiability Solving, Logical Systems and Proofs
Selected Courses: *Automated Reasoning and Satisfiability*, *Artificial Intelligence*, *Linear Programming*, *Algorithms in the Real World*, *Machine Learning, Computer Architecture*

Masters Fall 2018 ~ Spring 2020

California State University Fresno, CA
Majoring in Computer Science, Master of Science
Thesis advisor Todd Wilson
Master's Thesis: Classifying Proof Strategies in Abella
Focus: Programming Languages and Interactive Theorem Provers
4.0 GPA
Selected Courses: *Programing Language Principles*, *Artificial Intelligence*, *Introduction to Reinforcement Learning*, *Combinatorial Algorithm Analysis*

Undergraduate Fall 2014 ~ Spring 2018

California State University Fresno, CA
Research advisor Ming Li
Focus: Networking, Body Sensor Networks
Majored in Computer Science, Minored in Mathematics, Bachelor of Science
4.0 GPA

Highschool Fall 2010 ~ Spring 2014

Clovis High School, Clovis, CA
3.98 GPA (unweighted); High School Diploma

SELECTED PAPERS

Joseph E. Reeves, João Filipe, Min-Chien Hsu, Ruben Martins, and Marijn J. H. Heule. "The Impact of Literal Sorting on Cardinality Constraint Encodings" To appear in *Association for the Advancement of Artificial Intelligence* (*AAAI).* 2025.

Joseph E. Reeves, Marijn J. H. Heule, and Randal E. Bryant. "From Clauses to Klauses" In *Computer Aided Verification (CAV).* 2024.

Joseph E. Reeves, Benjamin Kiesl-Reiter, and Marijn J. H. Heule. "Propositional Proof Skeletons" *Tools and Algorithms for the Construction and Analysis of Systems (TACAS).* 2023.

Joseph E. Reeves, Marijn J. H. Heule, and Randal E. Bryant. "Preprocessing of Propagation Redundant Clauses" In *International Joint Conference of Automated Reasoning (IJCAR).* 2022.

Joseph E. Reeves, Marijn J. H. Heule, and Randal E. Bryant. "Moving Definition Variables in Quantified Boolean Formulas" In *Tools and Algorithms for the Construction and Analysis of Systems (TACAS).* 2022.

SUMMER INTERSNHIPS (SUMMER 2022, 2023)

Amazon Web Services, Automated Reasoning Group, Research Scientist Intern

Summer 2023, mentored by Benjamin Kiesl

Project: *Stochastic Local Search for Satisfiability Solving with Cardinality Constraints*
I worked with research scientists to develop a novel SLS algorithm to improve solving for SAT problems containing cardinality constraints.

Summer 2022, mentored by Benjamin Kiesl

Project: *Propositional Proof Skeletons*.
I worked with research scientists to develop propositional proof skeletons for satisfiability solvers. The proof skeletons summarize key facts learned by a solver that are important for reducing the amount of space required to store a proof.

TEACHING ASSOCIATE POSITIONS, CMU (SPRING 2023 ~ FALL 2023)

Department of Computer Science, Carnegie Mellon University, Pittsburgh, PA

Spring 2024: **Logic and Mechanized Reasoning**.
Instructors: Jeremy Avigad and Marijn Heule.
TA Duties:

- Provided feedback for homework assignments and exams
- Graded homework assignments and exams
- Held office hours and provided student feedback for assignments

Spring 2023: **Bug Catching: Automated Program Verification**.
Instructor: Matt Fredrikson.
TA Duties:

- Updated, maintained, and developed homework assignments and exams
- Graded homework assignments and exams
- Held office hours and provided student feedback for projects
- Taught a lecture and proof systems for satisfiability solvers.

TEACHING ASSOCIATE (LAB INSTRUCTOR) POSITIONS (FALL 2018 ~ FALL 2019)

Department of Computer Science, California State University Fresno, CA

Term	Course	Sections	Lecturer
Fall 2019	**CSCI 117 *Structures of Programming Languages*	2	Dr. Wilson
	CSCI 119 *Introduction to Finite Automata*	3	Dr. Wilson
Summer 2019	**CSCI 191-T *Programming Languages and Automata Theory*	1	Dr. Wilson
Spring 2019	CSCI 112 *Introduction to Computer Systems*	1	Prof. Banerjee
	CSCI 60 *Foundations of Computer Science*	2	Dr. Panagopoulos
	CSCI 5 *Computers and Applications*	2	Dr. Amarasinghe
Fall 2018	*CSCI 117 *Structures of Programming Languages*	3	Dr. Wilson
	CSCI 119 *Introduction to Finite Automata*	3	Dr. Wilson

Duties Include:

- Instructing 2-hour lab sessions with approximately 25 students per section.
- Organizing material and preparing instruction for lab assignments.

- Creating and grading lab assignments, quizzes, and test questions.
- Holding office hours with 1-hour per section.
- Collaborating with course lecturers, and maintaining correspondence between lab and lecture material.

* Dr. Wilson introduced a textbook not previously used, *Concepts, Techniques, and Models of Computer Programming*, and I assisted in creating a course schedule, lab assignments, and test questions.

** I wrote a simulation of the Oz language semantics in Haskell (later updated by Dr. Wilson), and I wrote a parser using the MegaParsec library in Haskell to allow execution of Oz programs in our Haskell simulation. These programs are currently being used by students for lab assignments.

AWARDS AND FELLOWSHIPS

- NDSEG Fellow, entering Fall 2022
- Tarek Alameldin Computer Science Scholarship Recipient (Fall 2019 ~ Spring 2020)
- Deans medal nominee for the department of computer science (Spring 2018)
- President's Honors Scholar of the Smittcamp Family Honors College (Undergrad)
- Lan Jin Computer Science Scholarship Recipient (Fall 2017 ~ Spring 2018)
- Department of Computer Science's F. Harold Downing Scholarship Recipient (Fall 2015 ~ Spring 2016)
- Honors Society of Phi Kappa Phi member (since 2016)

ACADEMIC EMPLOYMENT (FALL 2016 ~ FALL 2018)

Research Assistant
Department of Computer Science, California State University Fresno, CA
January 2017 ~ September 2018

Project Title "MRI: Development of a Cloud Based Instrument for Heterogeneous Biomedical Body Sensor Systems", NSF Grant # 1626586, Primary Investigators: Dr. Ming Li and Dr. B. Prabhakaran.

Camp Assistant Instructor
Department of Computer Science, California State University Fresno, CA
July 2017

Instructional Student Assistant
Department of Computer Science, California State University Fresno CA

April 12, 2017 ~ May 5, 2017

Supplemental Instruction Leader
Learning Center, California State University Fresno, CA
August 2016 ~ December 2016

COMMUNITY SERVICE

Performed over 70 hours of community service through the Smittcamp Family Honors College with various organizations including the Richter Center (trail building), the Poverello House (homeless shelter) and others.

JOURNAL AND CONFERENCE PUBLICATIONS AND POSTER PRESENTATIONS

Joseph E. Reeves, João Filipe, Min-Chien Hsu, Ruben Martins, and Marijn J. H. Heule. "The Impact of Literal Sorting on Cardinality Constraint Encodings" to appear in *Association for the Advancement of Artificial Intelligence* (*AAAI).* 2025.

Joseph E. Reeves. "Cardinality Constraints in Automated Reasoning" (Poster) *National Defense Science and Engineering Graduate (NDSEG) Fellowship Program 5th Annual Conference*. 2024
Honorable Mention (runner up for Computer and Computational Sciences)

Joseph E. Reeves, Marijn J. H. Heule, and Randal E. Bryant. "From Clauses to Klauses" *Computer Aided Verification (CAV).* 2024.

Joseph E. Reeves, Benjamin Kiesl-Reiter, and Marijn J. H. Heule. "Propositional Proof Skeletons" *Tools and Algorithms for the Construction and Analysis of Systems (TACAS).* 2023.

Joseph E. Reeves, Marijn J. H. Heule, and Randal E. Bryant. "Preprocessing of Propagation Redundant Clauses" *International Joint Conference of Automated Reasoning (IJCAR).* 2022.

Joseph E. Reeves, Marijn J. H. Heule, and Randal E. Bryant. "Moving Definition Variables in Quantified Boolean Formulas" *Tools and Algorithms for the Construction and Analysis of Systems (TACAS).* 2022.

Cayden R. Codel, **Joseph E. Reeves,** Marijn J. H. Heule, and Randal E. Bryant. “Bipartite Perfect Matching Benchmarks.” *In Pragmatics of SAT.* 2021

Joseph E. Reeves and Marijn J. H. Heule. “The Impact of Bounded Variable Elimination of Pigeonhole Formulas.” *In Pragmatics of SAT.* 2021.

Joseph Reeves, and Ming Li. "Context-Aware Analysis Scheduling in Wireless Body Area Networks." *2019 International Conference on Computing, Networking and Communications* (*ICNC*). IEEE, Feb. 18-21, 2019.

Joseph Reeves, Ming Li. "Context-Aware Analysis Scheduling in Wireless Body Area Networks" (Poster) *6th IEEE International Conference on Healthcare Informatics* (*ICHI*), June 4-7, 2018.

Ming Li, **Joseph Reeves** (undergraduate student), Carlos Moreno (graduate student). "Multi-level Sample Importance Ranking Based Progressive Transmission Strategy for Time Series Body Sensor Data," *Computer Networks Journal*, v.136, 2018, p. 119-127.

Joseph Reeves, Carlos Moreno, Ming Li, Chengyu Hu and B. Prabhakaran, “Data Reliability-Aware and Cloud- Assisted Software Infrastructure for Body Area Networks”, *International Conference on Body Area Networks* (*BODYNETS*), Dalian, China, Sept. 28-29, 2017.

Joseph Reeves, Ai Enkoji, and Ming Li, "Cloud-Assisted Software Infrastructure for Wireless Body Area Networks", poster presentation at 39th Annual Central California Research Symposium, April 25th, 2018.

Joseph Reeves, Carlos Moreno and Ming Li, “An Architecture for Cloud Based Body Sensor Systems”, poster presentation at the College of Science and Mathematics Celebration of Student Research and Achievement, May 12, 2017.