

# James Skripchuk

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## EDUCATION

### PhD in Computer Science

2020 – May 2025 (Expected, ABD)

North Carolina State University (NCSU)

Thesis: *Roles of Online Help-Seeking in Learning Programming: Challenges, Motivations, and Pedagogy*

Advisor: Thomas Price

Committee: Shiyen Jiang, Sandeep Kuttal, Noboru Matsuda

GPA: 4.0

### Honors B.S. in Computer Science

May 2020

University of Delaware (UD)

Minors: Electrical & Computer Engineering, Physics, Mathematics

GPA: 3.92, *Magna Cum Laude* (Top 4% of graduating class)

## HIGHLIGHTS

### Teaching, Mentorship, and Pedagogy

#### Undergraduate Instructor Positions

- |  |                 |
|--|-----------------|
| ▪ Algorithm Analysis ( <i>Full Instructor, 20 students</i> )                 | Elon University |
| ▪ Data Structures and Algorithms ( <i>Full Instructor, 10 students</i> )     | NCSSU           |
| ▪ Automated Learning and Data Analysis ( <i>Co-Instructor, 70 students</i> ) | NCSSU           |

#### Mentorship

- Organizer for NCSU's Socially-Relevant Computing and Analytics REU Site, coordinating 3 summer cohorts of 15 students from underrepresented backgrounds across 3 summers (*45 students total*).
- Direct mentor of 5 undergraduates, 4 of whom were authors on peer-reviewed publications (including one student first-authored publication), 2 of whom are pursuing graduate education.

#### Instructional Design

- Instructional designer for NCSU's AI Academy, a Department of Labor funded professional development course.
- Instructional designer for UD's Computational Thinking in Music course as part of an NSF funded initiative to introduce computational thinking in general education.

#### Professional Development

- NCSU's Engineering Education Certificate
- NCSU's Basic & Advanced Teaching Certificate
- NCSU's Preparing the Professorate Program

### Funding

Total: \$141,500

- |   |           |
|---|-----------|
| ▪ NSF Graduate Research Fellowship Program (GRFP)           | \$111,000 |
| ▪ NCSU Provost's Doctoral Fellowship                        | \$30,000  |
| ▪ NCSU Graduate Student Association Travel Assistance Award | \$500     |

### Publications

- 7 peer-reviewed publications, 3 first authored, one first authored by undergraduate mentee, one honorable mention for best paper award.

## TEACHING INTERESTS

Core Computing Curricula (e.g. Introductory Programming, Data Structures, Algorithms), Machine Learning, Data Science, Human-Computer Interaction, Sound & Music Computing

## RESEARCH INTERESTS

Computing Education, Help-Seeking, Self-Regulated Learning, Human-Computer Interaction

**RECOGNITION****NSF Graduate Research Fellowship Program (GRFP)**

National | 2021

A \$111,000 stipend given over three years to pursue the student's own graduate-level research agenda. Given to less than 2,000 of the 13,000 submitted applications from PhDs in varying STEM fields across the entire US, and considered one of the most prestigious scholarships offered through the NSF.

**Provost's Doctoral Fellowship**

NCSU | 2020

A \$30,000 fellowship designed to help in college and departmental efforts to recruit outstanding new doctoral students to NCSU. Prospective students cannot apply directly for these fellowships, but are nominated by their respective colleges.

**Computer and Information Sciences (CIS) Outstanding Senior Student Award**

UD | 2020

**Steven Geracimos Memorial Award**

UD | 2018

I was nominated for and receive both the CIS Outstanding Senior Student Award and the Steven Geracimos Memorial Award due to my continued and outstanding effort in academics, undergraduate research in computing education, and my role as an undergraduate teaching assistant. Central to this was my work under Lori Pollock as a Computational Thinking Fellow, where I co-designed and co-facilitated a new general education course - Computational Thinking in Music - in collaboration with computational musicologist Jennifer Shafer England.

**TEACHING  
EXPERIENCE &  
INSTRUCTIONAL  
DESIGN****CSC 422 – Automated Learning and Data Analysis**

NCSU | 70 Students | Spring 2024

*Co-Instructor*

- **Content:** NCSUs introductory machine learning course. Data collection and preparation, exploratory data analysis, various models and approaches (e.g. decision trees, KNN, SVMs, Bayes, regression, clustering) introduction to ANNs and deep learning.
- **Activities:** Taught 5/13 lectures; Introduced and facilitated topical ethical discussions at the beginning of lecture; designed and interspersed formative feedback questions into all lectures using classroom response system; modified homework assignments, created and graded low-stakes resubmittable formative quizzes; designed exams; designed study guides; hosted exam review sessions; graded and provided feedback for all phases of course project (proposal, midway report, final report).

**CSC 316 – Data Structures and Algorithms**

NCSU | 10 Students | Summer 2022

*Full Instructor*

- **Content:** NCSUs intermediate data structures and algorithms course. Abstract data types (e.g. lists, trees, maps, graphs) and their construction, algorithmic complexity and analysis, algorithm design strategies (e.g. divide-and-conquer, dynamic programming, greedy algorithms).
- **Activities:** Taught all lectures; Facilitated group interactions via in-class problem solving sessions using a flipped classroom model; created pre-class surveys in order to fine-tune lecture content.

**CSC 3300 - Algorithm Analysis**

Elon University | 20 Students | Fall 2021

*Full Instructor*

- **Content:** Elon University's intermediate algorithms course. Review of data structures, algorithmic complexity and analysis, algorithm design strategies, introduction to computational complexity theory (e.g. P vs. NP, reductions).
- **Activities:** Taught all lectures; Modified lecture content to increase accessibility; facilitated small group problem-solving exercises; hosted office hours; graded all homeworks, exams, and reports.

**Stanford's Code in Place**

Virtual | 10 students | Spring 2021

*Section Leader*

- **Content:** A virtual half-semester of Stanford's CS106A offered worldwide during the COVID-19 pandemic. Fundamentals of computer programming in Python, variables, and introductory graphics.
- **Activities:** Recruited and trained as a weekly section instructor; reviewed lecture materials; answered questions and fostered discussions in a small group environment.

- **Content:** AI Academy is a Department of Labor funded professional development course, which serves as “a pathway to industry credentials... to individuals interested in entering or advancing in the emerging field of AI”. Data collection and preparation, exploratory data analysis, various machine learning models with a focus on practical data science applications.
- **Activities:** Developed learning objectives, exercises, homeworks, hands-on workshops, and lessons; met weekly with instructor to receive feedback on materials. The redesigned materials were so well received that they now also serve as the base materials for NCSU’s undergraduate and graduate machine learning courses (CSC 422/522).

**MUSC 106 - Computational Thinking in Music**

UD | 2017-2019

*Instructional Designer, Undergraduate Teaching Assistant*

- **Content:** MUSC 106 was designed as a component NSF Funded initiative to introduce computational thinking in general education courses. Engaged listening habits, conversational knowledge of basic musical elements (melody, harmony, structure, rhythm), principles and applications of computational thinking (decomposition, data, abstraction, algorithms).
- **Activities:** Instructional designer as well as undergraduate TA for two instances of the class; developed learning objectives, exercises, homeworks, projects, and lessons in collaboration with a computational musicologist; created custom Python library for students to engage in algorithmic composition using data from the Hooktheory online music database.

**Teaching Assistant Positions**

CISC 320 - Introduction to Algorithms

UD | Spring 2020

CISC 108 - Introduction to Computer Science I

UD | Fall 2019

MUSC 106 - Computational Thinking in Music

UD | Spring 2018, Winter 2019

**PROFESSIONAL  
DEVELOPMENT**

**Engineering Education Certificate**

NCSU | 2021 - 2024 (Expected)

Certificate program focused on the unique challenges of teaching engineering topics, requiring a total of 12 credit-hours of graduate coursework. Three courses are dedicated to engineering education (EED), and one is an approved elective of the student’s choice. ED 790 is a capstone seminar in the education department, usually reserved for PhD students in the College of Education.

- EED 501: Teaching Undergraduate Engineers (*Complete*)
- EED 502: Content, Assessment, and Pedagogy (*Complete*)
- EED 511: Diversity & Social Justice in Engineering Education (*Complete*)
- ED 790: Scholar Leader: Systemic Change in Education (*In-Progress*)

**Preparing the Professoriate**

NCSU | 2023 – 2024

Participated in a selective, nationally recognized year-long program designed to give exceptional doctoral students and postdoctoral scholars an immersive mentoring, teaching, and future faculty preparation experience. Designed and executed a teaching project consisting of updating the content of NCSU’s undergraduate Automated Learning and Data Analysis Course with recent developments in Machine Learning (e.g. Deep Learning, Transformers, Diffusion Models), as well as integrating tighter formative feedback loops.

**Basic & Advanced Teaching Certificate**

NCSU | 2021 - 2024

NCSU’s Basic Teaching Certificate is structured to provide foundational workshops and electives that help develop one’s teaching and mentoring skills and how to effectively teach and mentor within a higher education environment. The Advanced Teaching Certificate builds upon this by discussing pivotal articles on teaching and the opportunity to participate in a community of practice focused on teaching.

**PUBLICATIONS  
AND  
PRESENTATIONS**

<sup>†</sup> indicates a current or former undergraduate research advisee.

★ indicates an award winning paper.

**Papers**

*Premiere conferences in Computing Education are considered high quality, selective venues for archival research. These conferences exceed many journals in their selectivity, visibility, and impact.*

J. Bacher, T. Price, **J. Skripchuk**, W. Wengran, Y. Shi, K. Tran. “Are Engineering Students Motivated by Interacting With Simulations They Program? A Controlled Study” *Proceedings of the ACM SIGCSE Virtual Conference 2024 (SIGCSE Virtual)*. Virtual. 2024. (XX% acceptance rate; XX/YY full papers)

**J. Skripchuk**, J. Bacher, T. Price. “An Investigation of the Drivers of Novice Programmers’ Intentions to Use Web Search and GenAI.” *Proceedings of the International Computing Education Research Conference (ICER)*. 2024. Melbourne, Victoria, Australia. (20.1% acceptance rate; 36/179 full papers)

★ K. Tran, J. Bacher, Y. Shi, **J. Skripchuk**, T. Price. “Overcoming Barriers in Scaling Computing Education Research Programming Tools: A Developer’s Perspective.” *Proceedings of the International Computing Education Research Conference (ICER)*. 2024. Melbourne, Victoria, Australia. (20.1% acceptance rate; 36/179 full papers). **Honorable Mention for Best Paper (given to 3/36 papers)**.

B. Wilson<sup>†</sup>, **J. Skripchuk**, J. Bacher. “Exploring Psychoacoustic Representations for Machine Learning Music Generation.” *International Conference on Computational Creativity (ICCC)*. 2023. Waterloo, Ontario, Canada.

**J. Skripchuk**, N. Bennett<sup>†</sup>, J. Zheng<sup>†</sup>, E. Li<sup>†</sup>, T. Price. *Analysis of Novices’ Web-Based Help-Seeking Behavior While Programming. Proceedings of the ACM SIGCSE Technical Symposium (SIGCSE)*. 2023. Toronto, Ontario, Canada. 2023. (35% acceptance rate; 165/474 full papers.)

**J. Skripchuk**, Y. Shi, T. Price. Identifying Common Errors in Open-ended Machine Learning Projects. *Proceedings of the ACM SIGCSE Technical Symposium (SIGCSE)*. 2023. Providence, RI. (29% acceptance rate; 144/516 full papers.)

W. Wang, A. Kwatra, **J. Skripchuk**, N. Gomes, A. Milliken, C. Martens, T. Barnes, T. Price. “Novices’ Learning Barriers When Using Code Examples in Open-Ended Programming.” *Proceedings of the ACM Innovation and Technology in Computer Science Education (ITiCSE)*. Paderborn, Germany. 2021. (31% acceptance rate; 84/275 full papers.)

**Posters**

**J. Skripchuk**, J. Bacher, Y. Shi, K. Tran, T. Price. “Novices’ Perceptions of Web-Search and AI for Programming.” *Proceedings of the ACM SIGCSE Technical Symposium (SIGCSE)*. Portland, OR. 2023.

J. S. England, **J. Skripchuk**. “Computational Thinking in Music: A Data-Driven General Education STEAM Course.” *Proceedings of the ACM SIGCSE Technical Symposium (SIGCSE)*. Portland, OR. 2020.

**Workshops and Invited Talks**

**J. Skripchuk**. “Identifying Common Errors in Open-Ended Machine Learning Projects”. *Computing Education Research at Davis Weekly Seminar*. UC Davis. Virtual. 2023.

A.C. Bart, T. Rutherford, **J. Skripchuk**. “Evaluating an Instrumented Python CS1 Course.” *4th Educational Data Mining in Computer Science Education (CSEDM) Virtual Workshop*. 2020.

**SERVICE**

**Park Scholar Selection Committee**  
*Committee Member*

NCSU | 2022 – 2023

Committee member for NCSU’s Park Scholarship program, a prestigious and selective four-year undergraduate scholarship award which aims to “bring exceptional students to NC State, based on outstanding accomplishments and potential in scholarship, leadership, service, and character.” Reviewed applications, interviewed students, and collaborated with other committee members in order to select recipients for the award.

## Conference Reviewing

ACM SIGCSE Technical Symposium (SIGCSE)

2023-2024

ACM Conference on Human Factors in Computing Systems (CHI)

2025

## ADVISING & MENTORSHIP

### **Socially-Relevant Computing and Analytics REU**

45 students total | Summers 2022 – 2024

*Graduate Mentor and Coordinator*

Served as both a mentor and coordinator for undergraduate students for a yearly summer Research Experience for Undergraduates (REU) at NCSU. Undergraduates from underrepresented backgrounds were immersed in summer cohorts of 15 students, and worked with different professors on real research projects. Coordinated with other graduate students for weekly presentations on research skills, such as literature reviews, study design, analysis methodologies, and presentation - all with the goal of producing publication worthy research. Organized weekly graduate student networking events, pairing undergraduates with different graduate students for in-depth conversations about academia and graduate student life - building camaraderie and fostering an inclusive research community.

### **Research Mentees**

*Students for whom I was their primary mentor. Mentorship goals were learning practical research skills (such as literature reviews, study design, research software design, analysis methodologies, and writing) and understanding how they relate to their personal and career goals.*

#### **Bryan Wilson**

2022 – 2023

*B.S. Electrical & Computer Engineering at NCSU, Class of 2024*

Advised on research project on representation learning for music generation, resulting with a first-author conference paper in ICCV '23. Completed two summer research internships at Apple in acoustic technology and currently applying to PhD programs.

#### **Camille Jones**

2022

*B.S. Computer Science at NCSU, Class of 2024*

Advised on an independent study investigating game-based learning methods, such as learning objective sequencing and modifying a commercial game to teach programming. Currently completing NCSU's Accelerated Bachelor's/Master's Program.

#### **Neil Bennett**

Summer 2022

*B.S. Computer Science at NCSU, Class of 2024*

Advised on a research project using qualitative methodologies to analyze novice programmer's web help-seeking behaviors, which was accepted as a full paper with him as an author in SIGCSE '23. Currently a Software Engineer at Blue Fusion Technologies.

#### **Jeffrey Zheng**

Summer 2022

*B.S. Computer Science at University of Pittsburgh, Class of 2026*

Advised on a research project using qualitative methodologies to analyze novice programmer's web help-seeking behaviors, which was accepted as a full paper with him as an author in SIGCSE '23. Went on to complete internships at Eerie Insurance and BNY.

#### **Eric Li**

2021 – 2022

*B.S. Mechanical Engineering at NCSU, Class of 2023*

Advised on an independent study creating a browser extension to log students behaviors while using the web to seek for help, which was accepted as a full paper with him as an author in SIGCSE '23. Currently a Software Engineer at Dell Technologies.