Yang Shi

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Education

North Carolina State University   **Raleigh, NC**
Ph. D., Computer Science (GPA 4.0), Goodnight Doctoral Fellow   *August, 2019 – May 2024*
Dissertation Committee: Thomas Price (Chair), Tiffany Barnes, Min Chi, Ken Koedinger (CMU), Eric Wiebe
Dissertation Title: Interpretable Code-Informed Student Modeling for CS Education
Supervised Students: Poorvaja Penmetsa (21' MSCS NCSU), Krupal Shah (20' MCS NCSU)

University of Georgia   **Athens, GA**
M. S., Computer Science, Graduate Assistantship   *August, 2015 – December, 2017*
Thesis Committee: Wenzhan Song (Chair), Hamid Arabnia, Tianming Liu

Central South University   **Changsha, China**
B. Eng., Automation, Undergraduate Excellence Award   *September, 2011 – June, 2015*
Thesis Advisor: Fang Liu

Employment

o **Research Intern**
  Microsoft Research, Redmond, WA.   *March 2022 – August 2022*
o **Research Scientist Intern**
  Stratifyd Inc., Charlotte, NC.   *May 2019 – August 2019*

Awards and Funding

Personal Awards and Certifications

o **Inclusive Teaching Certificate, NCSU** (*In Progress, 2022*)
o **Preparing the Professoriate, NCSU** (*In Progress, 2022*)
o **Mentored Teaching Fellowship, NCSU** (*2023*)
o **Goodnight Doctoral Fellowship, NCSU** (*2022*)
o **Best Paper Award, EDM 2021** (*2021*)
o **Summer Graduate Merit Award, NCSU** (*2021*)
o **AWS Cloud Credit Award for Research, Amazon AWS** (*2020*)
o **Graduate School Travel Award, University of Georgia** (*2018*)
o **Undergraduate Excellence Award, Central South University** (*2015*)

Research Funding

o NSF #2112635: AI Institute for Engaged Learning, AI Institute, Graduate Research Assistant, (*Spring 2023*)
o NSF #2013502: Generalizing Data-Driven Technologies to Improve Individualized STEM Instruction by Intelligent Tutors, Improving Undergraduate STEM Education (IUSE), Graduate Research Assistant, (*Fall 2020 - Spring 2021, Fall 2022*)
o Department of Labor: Artificial Intelligence Academy (AIA): North Carolina's Apprenticeships for Innovation, Course Instructor, (*Fall 2021 - Spring 2022*)

Publications (All Peer Reviewed)

(*Italics are supervised Master students*)

Book Chapters..

o [B1 (In Press)]. **Continuous Student Modeling for Programming in the Classroom: Challenges, Methods, and Evaluation.**
Ye Mao, Samiha Marwan, Preya Shabrina, Yang Shi, Thomas Price, Min Chi and Tiffany Barnes
Handbook of Artificial Intelligence In Education, 2023.

Journal Papers..

o [J2]. **Enhanced Cyber-physical Security in Internet of Things through Energy Auditing.**
Fangyu Li, Yang Shi, Shinde Aditya, Jin Ye and WenZhan Song
IEEE Internet of Things Journal. 2019.

o [J1]. **System Statistics Learning based IoT Security: Feasibility and Suitability.**
Fangyu Li, Shinde Aditya, Yang Shi, WenZhan Song and Xiang-Yang Li
IEEE Internet of Things Journal. 2019.

Conference Papers (All oral presentation)..

o [C10]. **KC-Finder: Automated Knowledge Component Discovery for Programming Problems.**
Yang Shi, Robin Schmucker, Min Chi, Tiffany Barnes and Thomas Price
The 16th International Conference on Educational Data Mining (EDM 2023), 2023. (Full Papers)

o [C9]. **Investigating the Impact of Emotions on the Quality of Novice Programmers' Code.**
Lisero Mugula, Rosemary Tufon, Yang Shi, Maria Valero, Adriane Randolph, Valentina Nino
Information Systems and Neuroscience: NeuroIS Retreat 2023.

o [C8]. **Code-DKT: A Code-based Knowledge Tracing Model for Programming Tasks.**
Yang Shi, Min Chi, Tiffany Barnes and Thomas Price
The 15th International Conference on Educational Data Mining (EDM 2022), 2022. (Acceptance Rate 28.6%, 26/91 Full Papers)

o [C7]. **Identifying Common Errors in Open-ended Machine Learning Projects.**
James Skripchuk, Yang Shi and Thomas Price
The 53rd ACM Technical Symposium on Computing Science Education (SIGCSE 2022), 2022. (Acceptance Rate 27.9%, 144/516 Full Papers)

o [C6]. **More With Less: Exploring How to Use Deep Learning Effectively through Semi-supervised Learning for Automatic Bug Detection in Student Code.**
Yang Shi*, Ye Mao*, Tiffany Barnes, Min Chi and Thomas Price
The 14th International Conference on Educational Data Mining (EDM 2021), 2021. (Combined Acceptance Rate 27.2%, 44/162 Short Papers)

o [C5]. **Knowing both when and where: Temporal-ASTNN for Early Prediction of Student Success in Novice Programming Tasks.**
Ye Mao, **Yang Shi**, Samiha Marwan, Thomas Price, Tiffany Barnes and Min Chi
The 14th International Conference on Educational Data Mining (EDM 2021), 2021. (Acceptance Rate 22%, 22/100 Full Papers)

o [C4]. **Just a Few Expert Constraints Can Help: Humanizing Data-Driven Subgoal Detection for Novice Programming.**
Samiha Marwan, Yang Shi, Ian Menezes, Min Chi, Tiffany Barnes and Thomas Price
The 14th International Conference on Educational Data Mining (EDM 2021), 2021. (Acceptance Rate 22%, 22/100 Full Papers, **Best Paper Award**)

o [C3]. **Toward Semi-Automatic Misconception Discovery Using Code Embeddings.**
Yang Shi, *Krupal Shah*, Wengran Wang, Samiha Marwan, *Poorvaja Penmetsa* and Thomas Price
The 11th International Conference on Learning Analytics & Knowledge (LAK 21), 2021. (Accep-

tance Rate 29.3%, 29/99 Short Papers)
- o [C2]. **Energy Audition based Cyber-Physical Attack Detection System in IoT.**
  Yang Shi, Fangyu Li, Wenzhan Song, Xiang-Yang Li and Jin Ye
  ACM SigMobile China, 2019.
- o [C1]. **Dynamic Time-frequency Feature Extraction for Brain Activity Recognition.**
  Yang Shi, Fangyu Li, Tianming Liu, Fred R. Beyette and WenZhan Song
  2018 40th Annual International Conference of the IEEE Engineering in Medicine and Biology
  Society (EMBC). 2018.

Poster Papers..
- o [P1]. **Developing Comic-based Learning Toolkits for Teaching Computing to Elementary School Learners.**
  Francisco Enrique Vicente Castro, Jane E, Sangho Suh, Weena Naowaprateep and Yang Shi
  The 54th ACM Technical Symposium on Computing Science Education (SIGCSE 2023), 2023.

Doctoral Consortium..
- o [D1]. **Interpretable Code-Informed Learning Analytics for CS Education.**
  Yang Shi
  The 13th International Conference on Learning Analytics Knowledge (LAK 23), 2023.

Workshop Papers..
- o [W3]. **Investigate Effectiveness of Code Features in Knowledge Tracing Task on Novice Programming Course.**
  Poorvaja Penmetsa, Yang Shi and Thomas Price
  Work-In-Progress Track, CSEDM Workshop @ EDM'21. 2021.
- o [W2]. **TEST_POSITIVE at W-NUT 2020 Shared Task-3: Joint Event Multi-task Learning for Slot Filling in Noisy Text.**
  Chacha Chen, Chieh-Yang Huang, Yaqi Hou, Yang Shi, Enyan Dai and Jiaqi Wang
  2020 The 6th Workshop on Noisy User-generated Text (W-NUT) at EMNLP 2020. 2020.
- o [W1]. **Comparing Feature Engineering Approaches to Predict Complex Programming Behaviors.**
  Wengran Wang, Yudong Rao, Yang Shi, Alexandra Milliken, Chris Martens, Tiffany Barnes and
  Thomas W Price
  CSEDM Workshop @ EDM'20. 2020.

Research Presentations

- o **Code-DKT: A Code-based Knowledge Tracing Model for Programming Tasks.** Department of Computer Science, UNC Charlotte. July 2022.
- o **Toward Semi-Automatic Misconception Discovery Using Code Embeddings.** Department of Computer Science, North Carolina State University. April 2021.

Teaching Experience

Instructor..
North Carolina State University
o CSC 522 Automated Learning and Data Analysis	*Spring 2023*
o AI Academy Data Mining	*Fall 2021*
o CSC 116 Intro to Programming – Java	*Summer 2020, Summer 2021*

Teaching Assistant..
North Carolina State University

- CSC 422/522 Automated Learning and Data Analysis *Spring 2020*
- CSC 510 Software Engineering *Fall 2019*

University of Georgia
- CSCI 3360 Data Science I *Spring 2018, Spring 2017*
- CSCI/PHIL 4550/6550 Introduction to Artificial Intelligence *Fall 2016*

Academic Services

Workshop Organizer/Co-Organizer/Chair

- [O4]. Bita Akram, Thomas Price, **Yang Shi**, Peter Brusilovski, Sharon I-Han Hsiao, Juho Leinonen: Educational Data Mining in Computer Science Education (CSEDM) Workshop, LAK'23. 2023.
- [O3]. Bita Akram, Thomas Price, **Yang Shi**, Peter Brusilovski, Sharon I-Han Hsiao: Educational Data Mining in Computer Science Education (CSEDM) Workshop, EDM'22. 2022.
- [O2]. Bita Akram, Thomas Price, **Yang Shi**, Peter Brusilovski, Sharon I-Han Hsiao: Educational Data Mining in Computer Science Education (CSEDM) Workshop, EDM'21. 2021.
- [O1]. Thomas Price, Peter Brusilovski, Sharon I-Han Hsiao, Ken Koedinger, **Yang Shi**: Educational Data Mining in Computer Science Education (CSEDM) Workshop, EDM'20. 2020.

Journal Reviewer

- International Journal of Artificial Intelligence in Education (2023)
- Journal of Educational Data Mining (2022-2023)
- Research and Practice in Technology Enhanced Learning (2022)
- IEEE Internet of Things Journal (2018 - 2022)
- IEEE Transactions on Network and Service Management (2020 - 2021)
- IEEE Transactions on Signal and Information Processing over Networks (2020)
- IEEE Open Journal of the Computer Society (2020)
- IEEE Access (2020)

Conference Program Committee/Reviewer

- ACM Symposium on User Interface Software and Technology (UIST) (2023) (Reviewer)
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) (2023) (PC)
- The International Conference on Learning Analytics & Knowledge (LAK) (2023) (PC)
- Symposium on Educational Advances in Artificial Intelligence (EAAI) (2023) (PC)
- Technical Symposium on Computer Science Education (SIGCSE) (2023) (PC)
- AAAI Conference on Artificial Intelligence (AAAI) (2023) (PC)
- International Conference on Educational Data Mining (EDM) (2022 - 2023) (PC)
- ACM Innovation and Technology in Computer Science Education (ITiCSE) (2022 - 2023) (PC)
- ACM CHI Conference on Human Factors in Computing Systems (2022) (Reviewer)

Conference Subreviewer:

SPLICE workshop, ACM ICER, IEEE INFOCOM, IEEE FWC

Professional Affiliations

Tau Beta Pi (NC Alpha '23), IEEE Student Member, ACM Student Member.