Samiha Marwan

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Highlights

- Computing Innovation (CI) Fellow and Postdoctoral Researcher at the University of Virginia.
- Ph.D. in Computer Science, North Carolina State University (NCSU).
- M.Sc. in Information and Computer Science, The British University in Egypt.
- Strong CS teaching background for more than 8 years-experience.

Education

- Ph.D. in Computer Science, College of Engineering, at North Carolina State University (NCSU), Raleigh, USA.   **2017 – 2021**
  - **Thesis topic:** Focused in the domain of computing education, particularly in developing and evaluating intelligent support features to promote students' cognitive and affective outcomes.
  - **GPA:** 3.95
- M.Sc. in Computer Science, Faculty of Informatics and Computer Science, at The British University in Egypt (BUE), Cairo, Egypt.   **2012 - 2016**
  - **Thesis topic:** Worked in the domain of DNA steganography. Particularly, I introduced a new algorithm combining different cryptography and DNA steganography methodologies to further achieve better data-hiding capacity and high security.
  - **GPA:** 3.64 (Ranked overall the first in my class)
- B.Sc. in Bioinformatics, Faculty of Computer and Information Sciences, Ain Shams University, Cairo, Egypt.   **2008 - 2012**
  - **Grade:** Excellent with honors
  - **GPA:** 3.72 (Ranked overall the second in my class)

Professional Experience

- **Computing Innovation (CI) Fellow & Postdoctoral Researcher** at the CS department, University of Virginia (UVA).   **Mar 2022 - Present**
- **Research Assistant** at the CS department, NCSU.   **Aug 2018 - Dec 2021**
- **Coordinator** for Introduction to Java Programming (online section) at the CS department, NCSU.   **Summer 2018, 2019**
  - Responsible for all course aspects: quizzes, labs, lectures, projects and exams.
  - Coordinating work with TAs to organize grading and office hours for students.
- **Teaching Assistant** at the CS department, NCSU.   **Aug 2017 – May 2018**
  - **Course:** Computer Organization and Assembly.

- **Lecturer Assistant** at the CS department, BUE, Egypt.   **Oct 2016 - June 2017**
  - Organizing and Teaching programming tutorials, and exams.
  - **Courses:** Data structures, and Introduction to programming
- **Teaching Assistant** at the British university in Egypt (BUE).   **Sep 2012 – Oct 2016**
  - **Courses:** Data structures, Introduction to programming**,** Analysis of algorithms

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Grants & Awards

- Computing Innovation (CI) Fellowship
  - **Funding Organization:** The Computing Research Association (CRA) and the Computing Community Consortium (CCC).
  - **Amount awarded:** ≈ $75,000/year; $150,000 total
  - **Date:** March 2022 - Feb 2024
- Accepted to participate in a Grant Writing and Peer Review Workshop
  - **Funding Organization:** National Science Foundation (NSF) & Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS).
  - **Amount awarded:** Transportation and Accommodation were fully funded
  - **Date:** June 2022
- Outstanding Research Award
  - **Funding Organization:** North Carolina State University, Department of Computer Science.
  - **Amount awarded:** $500
  - **Date:** Feb 2022
- Participated in reviewing and editing two research grant proposals with my supervisor (Dr. Thomas W. Price). One of which was funded.
  - **Funding Organization:** Improving Undergraduate STEM Education: Education and Human Resources (IUSE: EHR)
  - **Date:** 2019, 2020
- PhD Graduate Research Assistantship
  - **Funding Organization:** North Carolina State University.
  - **Amount awarded:** ≈ $42,000 total
  - **Date:** Aug 2017 - Dec 2021
- Invited to attend the 2019 Simon Initiative's LearnLab Summer School.
  - **Funding Organization:** Carnegie Mellon University (CMU) in Pittsburgh.
  - **Amount awarded:** $250
  - **Date:** July 29 - Aug 2, 2019
- Best M.Sc. Research Award
  - **Funding Organization:** The British University in Egypt.
  - **Amount awarded:** ≈ $1,000
  - **Date:** Oct 2016
- Masters degree Scholarship
  - **Funding Organization:** The British University in Egypt.
  - **Amount awarded:** 50% of overall tuition (≈ $4,000)
  - **Date:** Sept 2013 - June 2016

Professional Service

- ***Conference and Workshop Reviewing:***
  - Technical Symposium on Computer Science Education (SIGCSE)   **2019-2023**
  - CHI Conference on Human Factors in Computing Systems (CHI)   **2019, 2022**
  - International Computing Education Research Conference (ICER)   **2019-2021**

- ○ Conference on Innovation and Technology in CS Education (ITiCSE) **2019-2020**
- ○ Educational Data Mining in Computer Science Education (CSEDM) Workshop **2020**
- ○ The International Conference on Learning Analytics & Knowledge (LAK) **2020**
- *__Journal Reviewing:__*
  - ○ IEEE Transactions on Learning Technologies **2023**
  - ○ Journal of Educational Data Mining special issue on CSEDM (JEDM) **2022**
  - ○ ACM Transactions on Computing Education (TOCE) **2022**

Outreach Teaching Experience

- Organizing a series of programming classes for 9-12 years old students at Alnoor Islamic Center (AIC) – a non-profit organization. **Feb 2022 - Present**
  - ○ I create and design curriculum for each session.
  - ○ I teach the sessions with the help of other assistants.
- Leading the Marvels **Robotics** program for youth at AIC. **Sep 2022 - Present**
  - ○ I create curriculum, organize and teach 7 - 12 years old teams robotics classes, and presentation skills to compete in the FIRST Lego League (FLL) Competitions.
  - ○ I organize sessions for 13 - 18 years old teams in hardware, programming, 3D modeling, and marketing to participate in the FIRST Technical Challenge (FTC).
- Co-leading SPARCS at NCSU - Middle School Outreach. **Aug 2018 - March 2020**
  - ○ Leading and assisting in teaching middle school students computer science topics like programming and machine learning.
- Coaches teams of undergraduates in ACM/ICPC program. **May 2013 – May 2015**

Invited Talks

- Gave a research talk to the CSC 298 Introduction to Research Methods class at North Carolina State University.
  - ○ **Title:** "Adaptive Immediate Feedback for Block-Based Programming: Design and Evaluation"
  - ○ **Date:** October 2022
- Gave a research talk at the University of Virginia.
  - ○ **Title:** "Investigating Best Practices in the Design of Formative Feedback to Improve Students' Outcomes"
  - ○ **Date:** May 2022
- Gave a research talk at a seminar class, at the University of Washington.
  - ○ **Title:** "Designs and Evaluations of Formative Feedback Systems"
  - ○ **Date:** December 2021
- Gave a research talk in the Brown Bag seminar at North Carolina State University.
  - ○ **Title:** "Yay!! You did it ;)". The Impact of Proactive Positive Feedback on Novices in a Block-based Programming Environment"
  - ○ **Date:** October 2019
- Presented 9 first-author research papers at several computing education research (CER) conferences and workshops: SIGCSE, ITiCSE, ICER, EDM, CSEDM, LAK, and KoliCalling.
  - ○ **Date:** 2019 - 2021

Peer-Reviewed Publications

Peer-Reviewed Publications in Academic Journals

1. **S. Marwan,** and T. W. Price. "iSnap: Evolution and Evaluation of a Data-Driven Hint System for Block-based Programming". Accepted in the IEEE Transactions on Learning Technologies (TLT), 2022.
2. **S. Marwan**, B. Akram, T. Barnes and T. W. Price, "Adaptive Immediate Feedback for Block-Based Programming: Design and Evaluation," in IEEE Transactions on Learning Technologies, vol. 15, no. 3, pp. 406-420, 2022.
3. P. Shabrina, **S. Marwan**, A. Bennison, M. Chi, T. W. Price, and T. Barnes. "A Multicriteria Evaluation for Data-Driven Programming Feedback Systems: Accuracy, Effectiveness, Fallibility, and Students' Response." arXiv preprint arXiv:2208.05326, 2022.

Peer-Reviewed Publications in Conference Proceedings

4. J. Jeuring, H. Keuning, **S. Marwan**, D. Bouvier, C. Izu, N. Kiesler, T. Lehtinen, D. Lohr, A. Petersen and S. Sarsa. "Towards Giving Timely Formative Feedback and Hints to Novice Programmers". Submitted to the 27th Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE). 2022.
5. J. Jeuring, H. Keuning, **S. Marwan**, D. Bouvier, C. Izu, N. Kiesler, T. Lehtinen, D. Lohr, A. Petersen and S. Sarsa. "Steps Learners Take when Solving Programming Tasks, and How Learning Environments (Should) Respond to Them." Proceedings of the 27th ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE). 2022.
6. **S. Marwan**, P. Shabrina, A. Milliken, I. Menezes, V. Catete, T. W. Price, and T. Barnes, "Promoting Students' Progress-Monitoring Behavior during Block-Based Programming". Proceedings of the 21st Koli Calling International Conf. on Computing Education Research, 2021.
7. **S. Marwan**, Y. Shi, I. Menezes, M. Chi, T. Barnes, and T. W. Price, "Just a Few Expert Constraints Can Help: Humanizing Data-Driven Subgoal Detection for Novice Programming". Proceedings of the International Conference on Educational Data Mining (EDM) 2021. ***Best Full Paper Award***.
8. Y. Dong, P. Shabrina, **S. Marwan**, and T. Barnes, "You Really Need Help: Exploring Expert Reasons for Intervention During Block-based Programming Assignments". In *Proceedings of the 17th ACM Conference on International Computing Education Research*, 2021.
9. Y. Dong, **S. Marwan**, P. Shabrina, T. W. Price, and T. Barnes, "Using Student Trace Logs To Determine Meaningful Progress and Struggle During Programming Problem Solving". Proceedings of the International Conference on Educational Data Mining (EDM) 2021.
10. Y. Mao, Y. Shi, **S. Marwan**, T. W. Price, T. Barnes, and M. Chi, "Knowing both when and where: Temporal-ASTNN for Early Prediction of Student Success in Novice Programming Tasks". The International Conference on Educational Data Mining (EDM) 2021.
11. T.W. Price, **S. Marwan**, and J.J. Williams, "Exploring Design Choices in Data-driven Hints for Python Programming Homework." Proceedings of the Annual ACM Conference on Learning at Scale. (Work in progress paper), 2021.
12. Y. Shi, K. Shah, W. Wang, **S. Marwan,** P. Penmetsa, T. W. Price, "Toward Semi-Automatic Misconception Discovery Using Code Embeddings". International Conference on Learning Analytics and Knowledge (LAK), 2021.
13. G.Gao, **S.Marwan**, and T.W. Price. "Early Performance Prediction using Interpretable Patterns in Programming Process Data". SIGCSE Technical Symposium, 2021.

14. **S.Marwan**, G. Gao, S. Fisk, T.W. Price, and T. Barnes. "Adaptive Immediate Feedback Can Improve Novice Programming Engagement and Intention to Persist in Computer Science". In the sixteenth annual ACM International Computing Education Research (ICER), 2020.

15. **S.Marwan**, A. Dombe, and T. W. Price. "Unproductive Help-seeking in Programming: What it is and How to Address it?". Proceedings of the 25th Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE). 2020.

16. T.W. Price, **S. Marwan**, M. Winters, J.J. Williams, "An Evaluation of Data-driven Programming Hints in a Classroom Setting." International Conference on Artificial Intelligence in Education (AIED). 2020.

17. Y. Yao, **S. Marwan**, T.W. Price, T. Barnes, M. Chi, "What Time is It? Student Modeling Needs to Know". Proceedings of the 13th International Conference on Educational Data Mining (EDM) 2020.

18. W. Wang, Y. Rao, R. Zhi, **S. Marwan**, G. Gao, T.W. Price, "Step Tutor: Supporting Students through Step-by-Step Example-Based Feedback". Proceedings of the 25th Annual Conference on Innovation and Technology in Computer Science Education.

19. T. W. Price, J. J. Williams, J. Solyst, and **S. Marwan.** "Engaging Students with Instructor Solutions in Online Programming Homework ". Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems. 2020.

20. **S.Marwan**, J. J. Williams and T. W. Price. "An Evaluation of the Impact of Automated Programming Hints on Performance and Learning". In the fifteenth annual ACM International Computing Education Research (ICER). 2019.

21. **S.Marwan**, N. Lytle, J. J. Williams and T. W. Price. "The Impact of Adding Textual Explanations to Next-step **Hints** in a Novice Programming Environment". Proceedings of the 24th Annual Conference on Innovation and Technology in CS Education (ITiCSE). 2019.

22. Zhi, R., **S. Marwan**, Dong, Y., N. Lytle, T. W. Price and T. Barnes. "Toward Data-Driven Example Feedback for Novice Programming". In the 12th International Conference on Educational Data Mining. 2019.

23. T. W. Price, J. J. Williams, **S. Marwan.** "A Comparison of Two Designs for Automated Programming Hints". Companion Proceedings of the 9th International Conference on Learning Analytics & Knowledge (LAK19). 2019.

24. Zhi, R., T. W. Price, **S. Marwan**, A. Milliken, T. Barnes and M. Chi. "Exploring the Impact of Worked Examples in a Novice Programming Environment." ACM Special Interest Group on Computer Science Education (SIGCSE). 2019.

25. Dong, Y., **S. Marwan**, V. Cateté, T. Barnes and T. W. Price. "Defining Tinkering Behavior in Open-ended Block-based Programming Assignments." ACM Special Interest Group on Computer Science Education (SIGCSE). 2019.

Peer-Reviewed Publications in Workshops and Doctoral Consortium

26. **S.Marwan**, T.W. Price, M. Chi, and T. Barnes. "Immediate Data-Driven Positive Feedback Increases Engagement on Programming Homework for Novices." In the fourth Educational Data Mining in Computer Science Education (CSEDM) Workshop at EDM, 2020.

27. P. Shabrina, **S.Marwan**, T.W. Price, M.Chi, and T. Barnes. "The Impact of Data-driven Positive Programming Feedback: When it Helps, What Happens if it Goes Wrong, and How Students Respond". In the fourth Educational Data Mining in Computer Science Education (CSEDM) Workshop at EDM, 2020.

28. **S.Marwan** "Investigating Best Practices in the Design of Automated Feedback to Improve Students' Performance and Learning". In Proceedings of the 2020 ACM Conference on International Computing Education Research (ICER), Doctoral Consortium, 2020.