Michael J. Johnson

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RESEARCH INTERESTS

computing education, AI education, STEM education, educational technology, teacher professional development, broadening participation in computing

EDUCATION

Ph.D. in Computer Science, w/ specialization in Learning Sciences and Technology — Aug 2018 – Aug 2024
Minor in Expressive Technologies
- Advisor: Dr. Betsy DiSalvo
- Thesis: Exploring Computing Tools by Modality and Materiality

Georgia Institute of Technology, Atlanta, GA

M.S. in Computer Science, w/ specialization in Computational Perception and Robotics — May 2021 – May 2022
Georgia Institute of Technology, Atlanta, GA

B.S. in Electrical Engineering, Magna Cum Laude w/ Honors in Engineering — Aug 2014 – May 2018
Minor in Computer and Information Science
The Ohio State University, Columbus, OH

HONORS & ACADEMIC ACHIEVEMENTS

2025 SSMN Grantee, *Sloan Scholars Mentoring Network* — Aug 2025

Alfred P. Sloan Foundation Minority Ph.D. Fellowship, *Georgia Institute of Technology* — Sep 2021 – Aug 2024

Presidential Fellowship Awardee, *Georgia Institute of Technology* — Aug 2018 – May 2022

Goizueta Foundation Fellowship, *Georgia Institute of Technology* — Aug 2018 – May 2022

Magna Cum Laude, *The Ohio State University* — May 2018

Graduated with Honors in Engineering, *The Ohio State University* — May 2018

Dinner with Deans Nominee, *The Ohio State University* — Apr 2016
- Nominated as an outstanding student for great contributions to the Honors & Scholars community.

Diversity Scholar, Office of Diversity and Inclusion (ODI), *The Ohio State University* — Aug 2014 – May 2018

Green Engineering Scholars, *The Ohio State University Honors and Scholars Center* — Aug 2014 – May 2017

PUBLICATIONS AND PRESENTATIONS

A. Patents

1) Gombolay, M. C., **Johnson, M. J.**, Liu, R., & Gopalan, N. (2025). “Human-Robot Collaborative Flexible Manufacturing System and Method” (U.S. Patent No. 12,468,279). U.S. Patent and Trademark Office.

B. Peer-Reviewed Journal Publications

1) Guo, M., Apraiz, K., Jeon, Y., **Johnson, M. J.**, Evans, G., & Israel, M. (2025) “Robot Sharks: An AI and STEM Adventure for 5th Grade Students.” In Journal of Technology-Integrated Lessons and Teaching (JTILT) *(in press)*.

2) Hedlund-Botti, E., Schalkwyk, J., **Johnson, M.**, & Gombolay, M. (2025) “The Effects of Robot Learning on Human Teachers for Learning from Demonstration.” In Autonomous Robots, Volume 49, Article 33.

3) Schrum, M., Ghuy, M., Hedlund-Botti, E., Natarajan, M., **Johnson, M.**, & Gombolay, M. (2023) “Concerning Trends in Likert Scale Usage in Human-Robot Interaction: Towards Improving Best Practices.” In ACM Transactions on Human-Robot Interaction, Volume 12, Issue 3, Article 33, pp 1-32.

C. Peer-Reviewed Conference Publications

1) Bonilla, R.I., Wong-Villacres, M., **Johnson, M. J.**, Guadalupe, J., Abrigo, A., Julius Aravind, A., Jacome, F., & Segovia, B. (2025) “Error Resolution Strategies: What Do Novice Non-Native English Programmers Use?” In 2025 IEEE Global Engineering Education Conference (EDUCON).

2) **Johnson, M. J.** et al. (2024) “Lessons Learned from Developing and Implementing a High School CS Bridge Program.” In Proceedings of the Conference for Research on Equitable and Sustained Participation in Engineering, Computing, and Technology (RESPECT 2024).

3) **Johnson, M. J.**, Baker, R. A., Hovey, C. L., & DiSalvo, B. (2024) “Keeping Mindful of Modality: A Comparison of Computer Science Education Resources for Learning.” In Proceedings of the 23rd Koli Calling International Conference on Computing Education Research (Koli Calling ‘23).

4) **Johnson, M. J.**, Castro, F. E. V., DiSalvo, B., & DesPortes, K. (2023) “Chronicles of Exploration: Examining the Materiality of Computational Artifacts.” In Proceedings of the 2023 ACM Conference on International Computing Education Research V.1 (ICER '23 V1).

5) **Johnson, M. J.**, Liu, R., Gopalan, N., & Gombolay, M. C. (2021). “An Approach to Human-Robot Collaborative Drilling and Fastening in Aerospace Final Assembly.” In AIAA SciTech 2021 Forum (p. 0270).

6) *Hedlund, E., ***Johnson, M. J.**, & Gombolay, M. C. (2021). “The Effects of a Robot's Performance on Human Teachers for Learning from Demonstration Tasks.” In Proceedings of the 2021 ACM/IEEE International Conference on Human-Robot Interaction (pp. 207-215).

7) *Schrum, M. L., *Neville, G., ***Johnson, M. J.**, Moorman, N., Paleja, R., Feigh, K. M., & Gombolay, M. C. (2021). “Effects of Social Factors and Team Dynamics on Adoption of Collaborative Robot Autonomy.” In Proceedings of the 2021 ACM/IEEE International Conference on Human-Robot Interaction (pp. 149-157).

8) *Schrum, M. L., ***Johnson, M.**, *Ghuy, M., & Gombolay, M. C. (2020). “Four Years in Review: Statistical Practices of Likert Scales in Human-Robot Interaction.” Companion of the 16th Annual ACM/IEEE International Conference on Human-Robot Interaction.

D. Posters, Panels, and Short Talks

1) Barrett, J., **Johnson, M. J.**, & Israel, M. (2025) “Teacher Reviews of Block-Based Coding for K-12 Classrooms.” In Proceedings of the 56th ACM Technical Symposium on Computer Science Education V.2 (SIGCSE 2025).

2) **Johnson M. J.**, DiSalvo, B., Julius Aravind, A., Stallworth, C., Hovey, C. L., Muchna, M., & Sanders, S. (2023) “Advice for Building Recruiting Pipelines from High School to College: BridgeUP STEM Program.” In Proceedings of the 54th ACM Technical Symposium on Computer Science Education V.2 (SIGCSE 2023).

3) **Johnson, M. J.**, Piantella, B., Lowy, R., Leonard, E., Ryan, N., DiSalvo, B., & DesPortes, K. (2022). “Static and Changing Roles in Transdisciplinary Co-Design.” In Proceedings of the 16th International Conference of the Learning Sciences (ICLS 2022), pp. 2204-2205.

4) **Johnson, M. J.** & DiSalvo, B. (2022). "A Comparison of Physical and Digital Design for Computer Science Education." 2022 ACM Richard Tapia Celebration of Diversity in Computing Conference. *Competed as an ACM Student Research Competition Semi-Finalist; Received a Best Poster Presentation award.*

5) **Johnson, M. J.**, & DiSalvo, B. (2022). "Learning about Complex Adaptive Systems in Makerspaces." In Proceedings of the 53rd ACM Technical Symposium on Computer Science Education (SIGCSE TS 2022).

6) **Johnson, M.** & Gombolay, M. (2020). "Trust in Teamwork: Human Perception of Robot Outcomes in Kinesthetic Teaching." 2020 ACM Richard Tapia Celebration of Diversity in Computing Conference. *Competed as an ACM Student Research Competition Semi-Finalist.*

E. Presentations

1) **Johnson, M. J.** (2025). "For Your Consideration: A Teacher's Framework for Evaluating and Choosing CS EdTech." micro:bit LIVE California 2025.

2) **Johnson, M. J.** (2025). "Modality and Materiality: A Teacher's Framework for Evaluating and Choosing CS EdTech." Google Blockly Summit 2025.

3) **Johnson, M. J.**, Apraiz, K., Lacambra, N., & Kulkarni, P. (2025). "You Have CS Students in Your UTeach Program… Now What?" UTeach Conference 2025.

F. Invited Talks

1) **Johnson, M. J.** (2025). "For Your Consideration: A Teacher's Guide for Evaluating and Choosing CS EdTech." At the Micro:bit Educational Foundation.

G. Submitted Journal Papers

1) **Johnson, M. J.**, Martinez-Ramos, I., Hovey, C. L., Roberts, J., & DiSalvo, B. (2026). "Examining Programmable Learning Technologies in Team-Based CS Problem-Solving." Submitted to Computer Science Education (CSE). *Under review*.

H. Submitted Conference Papers

1) **Johnson, M. J.**, Bernstein, A., & Israel, M. (2026). "The PLT Framework: A Teacher's Guide for Evaluating and Choosing CS EdTech." Submitted to the 20th International Conference of the Learning Sciences (ICLS 2026). *Under review*.

RESEARCH EXPERIENCE

Postdoctoral Research Associate, *University of Florida* **Gainesville, FL**
Computing Education Research with Dr. Maya Israel
Teacher Support for Integrating Computing EdTech in K–12 Curricula Aug 2024 – present

- Research on mitigating barriers to integration of computing educational technologies in K–12 curricula.
- Constructing a database of programmable learning technologies to aid teachers in learning about and choosing computing education materials and curricula for their classrooms.
- Collaborating with pre- and in-service teachers to co-design and evaluate the database and other tools.

Programmable Learning Technologies Framework — Sep 2024 – present

- Research on supporting K–12 teachers in reviewing and evaluating computing educational technologies for computer programming.
- Supporting exploration of programmable learning technologies (PLTs) with pre- and in-service teachers through the constructs of modality and materiality.
- Soliciting feedback on which PLT properties would lead teachers to integrate them into classroom use.
- Results were published submitted for publication in one academic paper.

Mapping Conceptual Curriculum Development in Novice STEM Teachers — Aug 2024 – Jun 2025

- Research on how pre-service teachers develop connections between math, science, and computer science material when learning and teaching.
- Co-developed example curriculum for pre-service teachers, which they then taught to K–12 students.
- Studied the use of concept maps in understanding how pre-service teachers trace content across different subject areas.
- Results were published in one academic paper.

Graduate Research Assistant, *Georgia Institute of Technology* — **Atlanta, GA**

Computing Education Research with Dr. Betsy DiSalvo and Dr. Kayla DesPortes

Cross-Modality Instruction in High School Computing Education — Oct 2021 – May 2024

- Research on how learning about complex adaptive systems, music making, fabrication, and electronics differs across multiple mediums of interaction.
- Studied the use of computational thinking tools in both full class activities and pair programming dyads.
- Results were submitted or published in three academic papers, a poster, a panel, and a presentation.

Interdisciplinary Co-Design with Arts and Computing — Sep 2020 – May 2024

- Research on the interdisciplinary co-design process in how instructors from various disciplines communicate and learn from one another and how students' experiences are shaped by hybrid arts and computing exposure.
- Results were published in one academic paper and one poster.

Novice Perceptions on Makerspace Appeal — Mar 2022 – Sep 2022

- Research on how students and teachers perceive collegiate makerspaces as potential novice users.
- Organized middle school makerspace tour on Georgia Tech's campus.
- Mentored undergraduate students in designing and conducting a research experiment and in organizing with community partners.

Robotics Research with Dr. Matthew Gombolay and Dr. Ayanna Howard

Incentive Structure for Replacing Human Co-worker with Robotic Counterpart — Jan 2020 – Oct 2020

- Research on trust and empathy between co-workers working on human-human and human-robot teams with respect to incurred opportunity costs.
- Results were published in one academic paper.

Trust and Preference of Human-Robot Team post-Learning from Demonstration — Dec 2019 – Oct 2020

- Research on trust of humans teaching a robot to perform assembly tasks via different instruction methods via learning from demonstration.
- Results were published in two academic papers and a poster.

Human-Robot Collaborative Drilling and Fastening in Aerospace Final Assembly — Feb 2019 – Aug 2020
- Research on creating a robotic system to work alongside humans in aircraft assembly.
- Results were published in one academic paper.

Robotic Tutoring in Ping-Pong — Sep 2018 – Jan 2019
- Developed a vision system to track the movement of a ping-pong ball through 3-dimensional space.

Infant Motion Data Collection — May 2017 – Jul 2017
- Created a tool to record IMU data of infants' movements towards research for the early diagnosis of cerebral palsy in premature infants.

TEACHING EXPERIENCE

Co-Instructor, *The Kapor Center* — **Atlanta, GA**
Pedagogical Practices in UDL for CS, *CSforAtlanta Innovate CS Summit 2025* — Jun 2025

Adjunct Lecturer, *University of Florida* — **Gainesville, FL**
Classroom Interactions in Mathematics and Computer Science (SMT 3301C), *UFTeach* — Jan 2025 – May 2025

Guest Lecturer, *University of Florida* — **Gainesville, FL**
Integrating Technology in the Elementary Curriculum (EME 4401), *College of Education* — Sep 2025 – Nov 2025
Explorations in Teaching Mathematics and Science (MAE 2364), *UFTeach* — Feb 2025 – Mar 2025
Integrating Technology in the Elementary Curriculum (EME 4401), *College of Education* — Oct 2024

Guest Lecturer, *Georgia Institute of Technology* — **Atlanta, GA**
Educational Technology (CS 6460), *School of Interactive Computing* — Mar 2023
Educational Technology (CS 6460), *School of Interactive Computing* — Mar 2022
Educational Technology (CS 6460), *School of Interactive Computing* — Jun 2021

Co-Instructor, *Infosys Foundation USA* — **U.S. Virgin Islands**
micro:bit Tinkershop Class, *Pathfinders Summer Institute 2022* — Jun 2022 – Oct 2022

Co-Designer and Instructor, *Georgia Institute of Technology & NCWIT* — **Atlanta, GA**
Programming Course, *BridgeUP STEM* — Nov 2021 – May 2022

Instructor, Georgia Institute of Technology — **Atlanta, GA**
Summer Camps, *College of Computing* — May 2015 – Jul 2021
- Promoted STEM based education and cultivated interest in different fields of computer engineering for elementary through high school students.

Graduate Teaching Assistant, Georgia Institute of Technology — **Atlanta, GA**
Artificial Intelligence (CS 6601), *Online Master of Science Computer Science* — May 2020 – Jul 2020
Robotics: Intelligent Planning (CS 4649/7649), *School of Interactive Computing* — Jan 2019 – May 2019
Mathematical Foundations in Computer Engineering (ECE 3020), *School of Electrical and Computer Engineering* — Aug 2018 – Dec 2018

Graduate Student Coordinator, Georgia Institute of Technology — **Atlanta, GA**
SURE Robotics Program — May 2019 – July 2019
- Supported ten undergraduate students as they completed research throughout the summer.

OTHER WORK & LEADERSHIP EXPERIENCE

RoboGrads Student Organization, *Georgia Institute of Technology* **Atlanta, GA**

Vice President of Communications Apr 2020 - Apr 2021

- Organized email listservs, communication requests, and calendar of RoboGrads events for over 150 graduate students.
- Maintained meeting agendas and takes minutes during executive board meetings.
- Managed RoboGrads website, online chat forums, and document drives.

Vice President of Public Relations Sep 2019 – Apr 2020

- Represented over 150 graduate students of the Institute of Robotics and Intelligent Machines to external groups.
- Organized the first Southeast Robotics Symposium at Georgia Tech and contacted universities and research labs for participation.
- Collaborated with other representatives of the executive board to provide events and opportunities for all members in RoboGrads.

Office of Student Life, *The Ohio State University* **Columbus, OH**

Resident Manager Jan 2017 – May 2018

- Employed and managed 21 office assistants of a 24-hour front desk in a university resident hall.
- Completed tasks relating to management including scheduling employees, submitting timekeeping for payroll, and cultivating professional development.
- Executed additional duties including reporting weekly movement and vacancies in residence hall, maintaining security of over 300 residents' personal information, assisting residents with key and lock issues, and receiving and sorting mail.
- Instituted a website to streamline operations of the front desk staff, including space requests, key audits, and emails to residents.

Resident Advisor Sep 2015 – May 2017

- Responsible for building community and monitoring the safety of 40 college students within a university residence hall.
- Planned and executed engaging activities for the residence hall floor focused on wellness, diversity, and inclusion.
- Cultivated skills in leadership, teamwork, and administrative tasks each day as part of a paraprofessional staff.

SERVICE

School Chair Search Committee Member, *Georgia Institute of Technology* **Atlanta, GA**

Student Representative, *School of Interactive Computing* Apr 2021 – Dec 2021

Peer Reviewer

- *2026 ACM SIGCSE Technical Symposium (SIGCSE TS)*
- *2025 ACM Transactions on Computing Education (TOCE)*
- *2025 International Journal of Child-Computer Interaction (IJCCI)*
- *2024 Journal of Science Education and Technology (JSET)*
- *2024 ACM Conference for Research on Equitable and Sustained Participation in Engineering, Computing, and Technology (RESPECT)*
- *2024 ACM Interaction Design and Children Conference (IDC)*
- *2024 ACM SIGCSE Technical Symposium (SIGCSE TS)*
- *2023 ACM Designing Interactive Systems (DIS)*

- *2023 ACM Conference on Human Factors in Computing Systems (CHI)*
- *2023 ACM SIGCSE Technical Symposium (SIGCSE TS)*
- *2022 International Society of the Learning Sciences Annual Meeting (ISLS)*
- *2020 ACM Transactions on Human-Robot Interaction (THRI)*
- *2020 IEEE International Conference on Intelligent Robots and Systems (IROS)*
- *2019 IEEE International Conference on Robotics and Automation (ICRA)*

FIRST Robotics Mentor, *The Ohio State University, Columbus School for Girls* **Columbus, OH**
FIRST Robotics at Ohio State Jan 2015 – Apr 2018

- Assisted high school students in building robots for annual national competitions. Students designed and developed the chassis, control board, and additional mechanisms with guidance from mentors.

TECHNICAL SKILLS

Software Experience: Python, Arduino IDE, Java, C++, MATLAB, Unity

CAD Experience: Autodesk Inventor Pro, SolidWorks

Hardware Experience: micro:bit, Arduino, Raspberry Pi

Tools and Fabrication: soldering, breadboarding, laser cutter, 3D modeling and printing

REFERENCES

Dr. Maya Israel, Professor, College of Education, *University of Florida*
- Relationship: Postdoctoral Advisor, Director of the CS Everyone Center for Computer Science Education
- Email: misrael@coe.ufl.edu

Dr. Betsy DiSalvo, Associate Professor, College of Computing, *Georgia Institute of Technology*
- Relationship: PhD Advisor, Director of the Culture and Technology Lab (CATLab)
- Email: bdisalvo@cc.gatech.edu

Dr. Kayla DesPortes, Associate Professor, Steinhardt School of Culture, Education, and Human Development, *New York University*
- Relationship: Research Collaborator
- Email: kd90@nyu.edu

Dr. Christina Gardner-McCune, Associate Professor, Computer & Information Science & Engineering Department, *University of Florida*
- Relationship: Research Collaborator
- Email: gmccune@ufl.edu

Dr. Sherri Sanders, Director of Higher Education Initiatives and BridgeUP STEM, *University of Colorado Boulder, NCWIT*
- Relationship: Director of the BridgeUP STEM Program at Georgia Tech
- Email: sherri.sanders@colorado.edu

Cedric Stallworth, Assistant Dean for Outreach, College of Computing, *Georgia Institute of Technology*
- Relationship: Director of computing summer camps and co-facilitator of BridgeUP STEM
- Email: cedric@cc.gatech.edu