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Garrett C. Millar

PhD Student | Research & Teaching Assistant
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Personal Information

Homepage	https://gcmillar.github.io/
Google Scholar	Citations – 34 | h-index – 4 | i10-index – 1
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Education

2016 – Present	Doctorate of Philosophy: Center for Geospatial Analytics, Geospatial Analytics, North Carolina State University, Raleigh, NC Advisor: Dr. Helena Mitasova
2012 – 2016	Bachelor of Arts: Psychology, Minor in Philosophy, North Carolina State University, North Carolina, United States

Academic Work Experience

August 2017 – Present: Graduate Research & Teaching Assistant

Center for Geospatial Analytics; Geovisualization Lab - College of Natural Resources; North Carolina State University
Academic Advisor: Dr. Helena Mitasova
Advisor: Dr. Eric Money

Research Assistant

- Designing and assessing innovative technologies and applications for representing spatial data to inform critical decision-making and deliver actionable solutions for real-world geospatial problems. Specifically, helping users with varying levels of expertise explore and interact with complex spatial data through the design and implementation of immersive virtual environments, collaborative touch-screen displays, 3-D imagery and interactive decision-making systems.
  - **Geospatial Applications for Problem Solving (GAPS) Project**
    - Lead researcher working on the development and evaluation of the Geospatial Applications for Problem Solving (GAPS) program, designed to introduce high school students to geospatial science, GIS, and advanced geovisualization technologies through an intensive after-school STEM learning experience.
  - **Tangible Landscape**
    - Lead User Experience and Human-Computer Interaction researcher of open source tangible geospatial interface powered by GRASS GIS [http://tangible-landscape.github.io/]
  - **GRASS GIS wxGUI development**
    - Part of core development team, focusing on tools for visualization and new GUI and startup-screen features to enable intuitive software use for all user levels [https://en.wikipedia.org/wiki/GRASS_GIS]

Teaching Assistant

Provided teaching assistance for the following courses:

- GIS 205 - Spatial Thinking with GIS (70 students)
- GIS 501 - Geospatial Professionalism (16 students)

January 2018 – Present: **Graduate Research Assistant**
Teacher Education and Learning Services- College of Education; North Carolina State University
Advisor: Dr. Michael Evans

- GAPS project

August 2016 – May 2017: **Graduate Research Assistant**
Dr. Roger Azevedo's Laboratory for the Study of Metacognition and Advanced Learning Technologies – Department of Psychology; Human Factors and Applied Cognition, North Carolina State University

Overall Laboratory Duties

- Directing the acquisition and testing of advanced equipment in capturing and aligning multi-channel data (e.g., eye-tracking, facial expressions of emotion, electrodermal activity).
- Conducting analyses, preparing and writing conference submissions and manuscripts, and formulating research designs and questions
- Training undergraduate students on data collection and analysis, recruiting and running participants, and data preparation.
    - **MetaTutor IVH Project** (*Funded by*: National Science Foundation)
        - Designing and testing an intelligent multi-agent hypermedia system which collects multi-channel self-regulated learning data (e.g., eye-tracking, log-files, facial expressions of emotions) to help foster college students' STEM learning.
    - **Crystal Island** (*Funded by*: Social Sciences & Humanities Research Council of Canada)
        - Working with faculty members and research associates in Computer Science to design studies to examine how students learn from game-based learning environments built to teach students about science and literacy.
    - **Tangible Landscape Project**

January 2015 – August 2016: **Undergraduate Research Assistant**
Dr. Roger Azevedo's Laboratory for the Study of Metacognition and Advanced Learning Technologies – Department of Psychology – North Carolina State University, Raleigh, North Carolina

- MetaTutor Project
- MetaTutor IVH Project
- Crystal Island Project
- Tangible Landscape Project

Publications

Book Chapters

Azevedo, R., Taub, M., Mudrick, N. V., **Millar, G. C.,** Bradbury, A. E., & Price, M. J. (2017). Using data visualizations to foster emotion regulation during self-regulated learning with advanced learning technologies. In *Informational Environments* (pp. 225-247). Springer, Cham.

Manuscripts

Taub, M., Azevedo, R., Bradbury, A. E., **Millar, G. C.,** & Lester, J. (2018). Using sequence mining to reveal the efficiency in scientific reasoning during STEM learning with a game-based learning environment. *Learning and Instruction*, *54*, 93-103.

Taub, M., Mudrick, N. V., Azevedo, R., **Millar, G. C.,** Rowe, J., & Lester, J. (2017). Using multi-channel data with multi-level modeling to assess in-game performance during gameplay with Crystal Island. *Computers in Human Behavior.* 641-655.

Refereed Conference Proceedings

Millar, G. C., Tabrizian, P., Petrasova, A., Petras, V., Harmon, B., Mitasova, H., & Meetenmeyer, R. K. (2018, April). Tangible landscape: A hands-on method for teaching terrain analysis. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (p. 380). ACM. **[Winner of the Honorable Mention for Best Paper Award]**

Azevedo, R., **Millar, G. C.,** Taub, M., Mudrick, N. V., Bradbury, A. E., & Price, M. J. (2017). *Using data visualizations to foster emotion regulation during self-regulated learning with advanced learning technologies: a conceptual framework.* In X. Ochoa, I. Molenaar, & S. Dawson (Eds.), *Proceedings of the 7th International Conference on Learning Analytics & Knowledge*: *Understanding, Informing, and Improving Learning* (pp. 444-448). New York, NY: ACM.

Pryor, M., **Millar, G. C.,** McNamara, A., Kaufman, L., & McLaughlin, A. C. (2017, September). Creating Content Guidelines for Consistent Display of Information on an Ecommerce Website. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 61, No. 1, pp. 1834-1838). Sage CA: Los Angeles, CA: SAGE Publications.

Azevedo, R., Martin, S. A., Taub, M., Mudrick, N., **Millar, G. C.,** & Grafsgaard, J. (2016). *Are pedagogical agents' external regulation effective in fostering learning with intelligent tutoring systems?* In A. Micarelli, J. Stamper, & K. Panourgia (Eds.), *Proceedings of the 13th International Conference on Intelligent Tutoring Systems—Lecture Notes in Computer Science 9684* (pp. 197-207). The Netherlands: Springer. **[Winner of the Best Conference Paper Award]**

Martin, S. A., Azevedo, R., Taub, M., Mudrick, N., **Millar, G. C.,** & Grafsgaard, J. (2016, June). *Are there benefits of using multiple pedagogical agents to support and foster self-regulated learning in an intelligent tutoring system?* In A. Micarelli, J. Stamper, & K. Panourgia (Eds.), *Proceedings of the 13th International Conference on Intelligent Tutoring Systems—Lecture Notes in Computer Science 9684* (pp. 273-279). The Netherlands: Springer.

Taub, M., Mudrick, N., Azevedo, R., **Millar, G. C.,** Rowe, J., & Lester, J. (2016, June). *Using multi-level modeling with eye-tracking data to predict metacognitive monitoring and self-regulated learning with Crystal Island*. In A. Micarelli, J. Stamper, & K. Panourgia (Eds.), *Proceedings of the 13th International Conference on Intelligent Tutoring Systems—Lecture Notes in Computer Science 9684* (pp. 240-246). The Netherlands: Springer.

Paper and Poster Presentations

Millar, G. C., Money, E. S., Bunds, K. S., & Mitasova, H., (2018). Increasing underrepresented high school students' stem career awareness and interest: An informal geospatial science program. In *AGU Fall Meeting Abstracts*.

Petrasova, A., Tabrizian, P., Harmon, B. A., Petras, V., **Millar, G. C.,** Mitasova, H., & Meentemeyer, R. K. (2017). Learning topography with Tangible Landscape games. In *AGU Fall Meeting Abstracts*.

Pryor, M., **Millar G. C**, McNamara, A., Kaufman L., & McLaughlin A. C., (2017). *Creating content guidelines for consistent display of information on an ecommerce website.* Paper presented at the annual meeting of the Human Factors and Ergonomics Society, Austin, TX.

Azevedo, R., Mudrick, N. V., Taub, M., **Millar, G. C.,** Bradbury, A. E., & Price, M. J. (2017). *Examining cognitive, metacognitive, and affective processes during multimedia learning with an intelligent virtual human.* Paper presented at the biennial meeting of the European Association for Research on Learning and Instruction (EARLI), Tampere, Finland.

Azevedo, R., Taub, M., Mudrick, N. V., **Millar, G. C.,** Bradbury, A. E., & Price, M. J. (2017). *Measuring, analyzing, and inferring temporally unfolding self-regulatory processes from multimodal data.* Paper presented at the biennial meeting of the European Association for Research on Learning and Instruction (EARLI), Tampere, Finland.

Mudrick, N. V., Azevedo, R., Taub, M., **Millar, G. C**., Price, M. J., Bradbury, A. E., & Grafsgaard, J. F. (2017). *Physiological indicators of critical affective processes during multimedia learning with a virtual human.* Paper presented at the biennial meeting of the European Association for Research on Learning and Instruction (EARLI), Tampere, Finland.

Taub, M., Azevedo, R., Bradury, A. E., **Millar, G. C.,** Price, M. J., & Mudrick, N. V. (2017). *Using sequence mining to measure students' SRL and scientific reasoning during learning with a game-based learning environment.* Paper presented at the biennial meeting of the European Association for Research on Learning and Instruction (EARLI), Tampere, Finland.

Pryor, M., **Millar G. C**, McNamara, A., Kaufman L., & McLaughlin A. C., (2017). *Using Signal Detection Theory to Quantify Effects of Changes in Ecommerce Websites.* Poster presented at the first annual Southeastern Human Factors Applied Research Conference (SHARC), Raleigh, NC.

Azevedo, R., Taub, M., Mudrick, N. V., Grafsgaard, J. F., **Millar, G. C**., & Price. M. (2017). *Understanding and reasoning about cognitive, metacognitive, and affective processes used during complex learning with advanced learning technologies*. Paper presented at the annual meeting of the American Educational Research Association (AERA), San Antonio, TX.

Mudrick, N. V., Azevedo, R., Taub, M., Grafsgaard, J. F., **Millar, G. C.,** Price, M. J., Lester, J., Rowe, J., Taylor, R., Smith, A., & Culbertson. K. (2017). *Can intelligent virtual humans impact the accuracy of learners' metacognitive monitoring during complex multimedia learning?* Paper presented at the annual meeting of the American Educational Research Association (AERA), San Antonio, TX.

Taub, M., Mudrick, N. V., Azevedo, R., **Millar, G. C.,** Rowe, J., & Lester, J. (2017). *Using eye-tracking and log-file data as indicators of metacognitive monitoring and cognitive learning strategies with game-based learning environments?* Paper presented at the annual meeting of the American Educational Research Association (AERA), San Antonio, TX.

Azevedo, A., **Millar, G. C.,** Taub, M., Mudrick, N. V., Bradbury, A. E., & Price, M. J. (2017). Using data visualizations to foster emotion regulation during self-regulated learning with advanced learning technologies: A conceptual framework. Paper presented at the 7th International Conference on Learning Analytics & Knowledge Conference, Vancouver, BC, Canada.

Wortha, F., Azevedo, R., Taub, M., Mudrick, N, V., **Millar, G. C.,** & Narciss, S. (2017). *Emotional and behavioral reactions to feedback (dis-)confirming judgments of learning when learning with MetaTutor*. Paper presented at the annual meeting of the American Educational Research, San Antonio, TX.

Grafsgaard, J. F., Azevedo, R., Mudrick, N. V., Taub, M., & **Millar, G. C.** (2017). *Does skin conductance response indicate metacognitive processes?* Paper presented at the annual meeting of the American Educational Research, San Antonio, TX.

Wortha, F., Azevedo, R., Taub, M., Mudrick, N., Martin, S. A., & **Millar, G. C.**, & Narciss, S. (2016). *Judgements of learning during learning with hypermedia: How do they affect study time allocation and study behaviors?* Paper presented at the biennial meeting of the European Association for Research on Learning and Instruction (EARLI) Metacognition SIG, Nijmegen, The Netherlands.

Azevedo, R., Martin, S. A., Taub, M., Mudrick, N., **Millar, G. C.**, & Grafsgaard, J. (2016). *Are pedagogical agents' external regulation effective in fostering learning with intelligent tutoring systems?* Paper presented at the 13th International Conference on Intelligent Tutoring Systems (ITS 2016), Zagreb, Croatia.

Azevedo. R., Mudrick, N. V., Taub, M., Martin, S., Wortha, F., & **Millar, G. C.** (2016*). The coupling between metacognition and emotions during STEM learning with advanced learning technologies: A critical analysis and implications for future research.* Paper presented at the 2nd International Workshop on Affect, Meta-Affect, Data and Learning (AMADL 2016) at the 13th International Conference on Intelligent Tutoring Systems (ITS 2016), Zagreb, Croatia.

Martin, S. A., Azevedo, R., Taub, M., Mudrick, N., **Millar, G. C.,** & Grafsgaard, J. (2016). *Are there benefits of using multiple pedagogical agents to support and foster self-regulated learning in an intelligent tutoring system?* Paper presented at the 13th International Conference on Intelligent Tutoring Systems (ITS 2016), Zagreb, Croatia.

Taub, M., Mudrick, N., Azevedo, R., **Millar, G. C.,** Rowe, J., & Lester, J. (2016). *Using multi-level modeling with eye-tracking data to predict metacognitive monitoring and self-regulated learning with Crystal Island*. Paper presented at the 13th International Conference on Intelligent Tutoring Systems (ITS 2016), Zagreb, Croatia.

Taub, M., Azevedo, R., Martin, S. A., **Millar, G. C**., & Wortha, F. (2016). *Aligning log-file and facial expression data to validate assumptions linking SRL, metacognitive monitoring, and emotions during learning with a multi-agent hypermedia-learning environment.* Structured poster presented at the annual meeting of the American Educational Research Association, Washington, DC.

Wortha, F., Azevedo, R., Taub, M., Mudrick, N. V., Martin, S. A., **Millar, G. C.,** & Narciss, S. (2016). *Emotion profiles: The importance of emotions during learning with a multi-agent hypermedia-learning environment.* Paper presented at the annual meeting of the American Educational Research Association, Washington, DC.

Taub, M., Azevedo, R., Mudrick, N., Martin, S. A., & **Millar, G. C.** (2015). *Using process data to examine self-regulatory processes during learning with MetaTutor.* Paper presented at the biennial meeting of the European Association for Research on Learning and Instruction (EARLI), Limassol, Cyprus.

Technical Skills

PROGRAMMING	GIS	VR | 3D | GAME	GRAPHICS	STATISTICS
Python	ARCGIS	Blender	Photoshop	Multivariate models
Latex	GRASSGIS	World Vizard	Illustrator	Mixed models
Javascript	QGIS			Spatial statistics
CSS	GDAL/OGR			SPSS
HTML	PostGIS			R
				SAS JMP