

## Personal Information

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Homepage	<a href="http://gcmillar.github.io">gcmillar.github.io</a>
Google Scholar	Citations – 86   h-index – 5   i10-index – 4
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## Education

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

## Academic Work Experience

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### August 2017 – Present: **Graduate Research & Teaching Assistant**

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

### **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.
  - **Tangible Landscape**
    - Lead User Experience and Human-Computer Interaction researcher of open source tangible geospatial interface powered by GRASS GIS.  
[[tangible-landscape.github.io](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.  
[[en.wikipedia.org/wiki/GRASS\\_GIS](http://en.wikipedia.org/wiki/GRASS_GIS)]
  - **United States Department of Agriculture - Animal and Plant Health Inspection Service**
    - Lead User Experience and Human-Computer Interaction researcher of PoPS (Pest or Pathogen Spread Model)—a framework for modeling the spread of pests or pathogens across a landscape.  
[<https://popsmodel.org/>]
  - **Geospatial Applications for Problem Solving (GAPS) Project**
    - Lead researcher working on the development and evaluation of the Geospatial Applications for Problem Solving (GAPS) program, which introduces high school students to geospatial science, GIS, and advanced geovisualization technologies in an after-school STEM learning experience.  
[<https://gaps.cnr.ncsu.edu/>]

### **Teaching Assistant**

Provided teaching assistance for the following courses:

- GIS 205 – Spatial Thinking with GIS (70 students)
- GIS 501 – Geospatial Professionalism (16 students)
- GIS 582 – Geospatial Modeling (20 students)
- GIS 595 – Tools for Open Geospatial Science (9 students)

#### January 2018 – January 2019: 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

- **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 IVH Project
- Crystal Island Project
- Tangible Landscape Project

### Technical Skills

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#### PROGRAMMING

Python 

Javascript 

LaTeX 

CSS 

HTML 

R 

#### GIS


ARCGIS 

GRASSGIS 

QGIS 

GDAL/OGR 

PostGIS 


Leaflet 

#### GRAPHICS

Photoshop 


Illustrator 


Indesign 

Blender 

#### STATISTICS

Multivariate models 

Mixed models 

Spatial statistics 

SPSS 

SAS JMP 

### Publications

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#### **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**

**Millar, G. C.**, Mitas, O., Boode, W., Hoeke, L., de Kruijff, J., & Mitasova, H. (in preparation). Space-time Analytics of Human Physiology for Urban Planning. *Computers, Environment and Urban Systems*.

- 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.**, Mitas, O., Boode, W., Hoeke, L., de Kruijff, J., Tateosian, L., & Mitasova, H. (under review). *Stress3d: An Interactive & 3D Framework for Exploring Human Behavior*. 2019 IEEE Conference on Visual Analytics Science and Technology (VAST). IEEE.
- Millar, G. C.**, Tabrizian, P., Petrasova, A., Petras, V., Harmon, B., Mitasova, H., & Meetenmeyer, R. K. (2018). *Tangible landscape: A hands-on method for teaching terrain analysis*. In Proceedings of the 2018 chi conference on human factors in computing systems (pp. 380:1–380:12). New York, NY, USA: 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 7<sup>th</sup> 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*.
- Millar, G. C.**, Tabrizian, P., Petrasova, A., Petras, V., Harmon, B., Mitasova, H., & Meetenmeyer, R. K. (2018). Hands-on Methods for Teaching Landscape Form and Processes. In *US-IALE Spring 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.