Garrett C. Millar

PhD Student | Research & Teaching Assistant

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EDUCATION

2018 – Present

Doctorate of Philosophy: Geospatial Analytics

North Carolina State University, Raleigh, NC, U
Advisor: Dr. Helena Mitasova

2016 – 2018 [1]

Doctorate of Philosophy: Psychology

North Carolina State University, Raleigh, NC, US
Advisor: Dr. Roger Azevedo

2012 – 2016

Bachelor of Arts: Psychology

North Carolina State University, Raleigh, NC, US

EXPERIENCE

Graduate Research & Teaching Assistant

August 2017 – Present

Center for Geospatial Analytics – Geovisualization Lab | College of Natural Resources | NCSU

Advisor: Dr. Helena Mitasova

Research Assistant

Designing, implementing, and assessing innovative technologies and applications for representing spatial data to inform critical decision-making and deliver actionable solutions for real-world geospatial problems.

- **Tangible Landscape**
  - Lead User Experience and Human-Computer Interaction researcher of open source tangible geospatial interface powered by GRASS GIS. [tangible-landscape.github.io]
- **GRASS GIS wxGUI development**
  - Development work 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]
- **United States Department of Agriculture - Animal and Plant Health Inspection Service**
  - Co-leading User Experience and Human-Computer Interaction research on PoPS (Pest or Pathogen Spread Model)—a framework for modeling the spread of pests or pathogens across a landscape. [popsmodel.org]
- **Geospatial Applications for Problem Solving (GAPS) Project**
  - Lead researcher for the evaluation of the GAPS program, which introduces high school students to geospatial science, GIS, and advanced geovisualization technologies in an after-school STEM learning experience. [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)

Graduate Research Assistant

January 2018 – January 2019

Teacher Education and Learning Services – College of Education | NCSU

Advisor: Dr. Michael Evans

- **GAPS Project**
  - Lead researcher and grant proposal writer for the GAPS program.

[1] Transferred from Human Factors and Applied Cognition to Geospatial Analytics in February 2018.

Graduate Research Assistant

August 2016 – May 2017

Laboratory for the Study of Metacognition & Advanced Learning Technologies – Department of Psychology | HFAC | NCSU

Advisor: Dr. Roger Azevedo

- **MetaTutor IVH Project**
  - 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**
  - 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**

SKILLS

Programming

Python
Javascript
LaTeX
CSS
HTML
R

GIS

ArcGIS
GRASS GIS
QGIS
GDAL / OGR
PostGIS
Leaflet

Graphics

Photoshop
Illustrator
Lightroom
Indesign
Blender

Statistics

Multivariate Models
Mixed Models
Spatial Statistics
SPSS
SAS JMP

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

Manuscripts

Millar, G. C., Mitas, O., Boode, W., Hoeke, L., de Kruijff, J., Mitasova, H. (under review). 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.,

Meentemeyer, R. K. (2018). Tangible landscape: A hands-on method for teachingterrain analysis. In Proceedings of the 2018 chi conference on human factors incomputing 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 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 & 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., Meentemeyer, 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.