

JOHN S. KINNEBREW

Bridj
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EXPERTISE

RESEARCH AREAS

Machine learning, combinatorial optimization, coordination and negotiation in multi-agent systems, user behavior modeling, autonomous planning and scheduling, intelligent agents, learning environments

SELECTED LANGUAGES & FRAMEWORKS/PLATFORMS

Python, Java, SQL, C++, and R
Amazon Web Services, Docker, Celery, and PostgreSQL

EDUCATION

VANDERBILT UNIVERSITY

PH.D. IN COMPUTER SCIENCE

Nashville, TN

May, 2010

Dissertation: "Global Sensor Web Coordination and Control using Multi-Agent Systems".
AAAI 2009 Doctoral Consortium. IBM Graduate Fellowship.

VANDERBILT UNIVERSITY

M.S. IN COMPUTER SCIENCE

Nashville, TN

May, 2007

Concentration in Artificial Intelligence (AI). IBM Graduate Fellowship.

HARVARD UNIVERSITY

B.A. CUM LAUDE IN COMPUTER SCIENCE

Cambridge, MA

June, 2001

Concentration in AI. Detur Book Prize, John Harvard Scholarship, Harvard College Scholarship, and National Merit Scholarship.

PROFESSIONAL EXPERIENCE

RESEARCH SCIENTIST

10/2015 - Present

BRIDJ Boston, MA

Led the research and data science group, applying machine learning and AI optimization techniques to transportation modeling, prediction, and optimization to enable intelligent, data-driven mass transit.

- Took Bridj pop-up bus-stop routing from fixed stops/routes that were updated by manual data analysis on a multi-week timeframe to real-time, optimal stop routing – designed and implemented a Python-based constraint optimization system employing current and predicted passenger origins/destinations with current traffic conditions in a containerized production backend on AWS using Celery and RabbitMQ for asynchronous task distribution.
- Developed a citywide multi-vehicle optimization system employing a novel hierarchical co-evolutionary approach to combinatorial optimization with geospatial aspects. Employed this system to identify routing corridors and vehicle allocation, optimizing passengers per hour based on predicted origin/destination demand. Implemented containerized production backend system to serve as the foundation of a next generation, distributed Bridj routing engine.
- Collaborated on the design and implementation of a large-scale origin-to-destination flow clustering system in Python (using Redis and PostgreSQL) for identifying candidate stops and predicting travel demand among them.
- Mentored and collaborated with data science associates on predictive modeling, analysis, and visualization of urban movement patterns, bus travel and cycle times, and Bridj service demand patterns in Python (including Pandas, scikit-learn, statsmodels, SciPy, and NumPy) with a PostgreSQL (+PostGIS) database and AWS S3 Athena.

RESEARCH SCIENTIST

6/2013 – 10/2015

INSTITUTE FOR SOFTWARE INTEGRATED SYSTEMS, VANDERBILT UNIVERSITY

Nashville, TN

Co-PI with leadership role in design and development of two adaptive learning environment projects for middle school students: *CTSiM* (promoting computational thinking skills in concert with science learning through visual programming, simulation, and domain-specific modeling languages) and *SimSelf* (leveraging interaction with pedagogical agents and causal modeling activities for developing self-regulated learning skills).

- Designed novel data mining algorithms that incorporate learning context and changes with multiple dimensions of complex, hierarchical features for the identification of pedagogically-relevant behavior patterns. Implemented algorithms, as well as data processing workflow, using Java, Apache Commons frameworks, and MySQL databases.
- Integrated model-driven assessment with data-driven analysis to iteratively design and improve models of learner behavior, which then better inform decisions by pedagogical agents. Led analysis efforts to evaluate and improve efficacy of adaptive agents, including implementing components of the analytic workflow in Python and R.
- Led software development team including one programmer, one postdoc, and four graduate students. Implemented portions of the event-driven infrastructure for modular learning tools using Java and Google's Guava and Guice.

Researcher on two simulation-based learning environment projects for high school students: *C3STEM* (engaging students in integrated STEM learning through computational modeling and high-fidelity simulations) and *EGAME* (connecting intuitive understanding from gameplay with formal physics concepts).

- Designed novel data mining and machine learning techniques for modeling and differentiating student learning behaviors across a variety of contexts. Led the implementation of new mining and modeling techniques in Java and Python, and implemented the core data processing workflow in Python (NumPy, Pandas, scikit-learn) with MongoDB.
- Developed and deployed a dynamic metadata mark-up approach that relates simulation/game context to the learning context for more effective analysis and mining of student learning behavior.

RESEARCH ASSOCIATE

6/2010 – 6/2013

INSTITUTE FOR SOFTWARE INTEGRATED SYSTEMS, VANDERBILT UNIVERSITY

Nashville, TN

Researcher and software developer on the *Betty's Brain* project (a learning-by-teaching environment promoting preparation for future learning with support from adaptive pedagogical agents).

- Designed and implemented Hidden Markov Modeling and sequence mining approaches to analyze learning behavior in Java and R.
- Led data mining and analytics efforts to evaluate student-agent interactions and iteratively improve the learning environment in Java with MySQL databases.

Software developer on the *HALF* project (a touch-based environment and curriculum for teaching fractions with low-achieving and at-risk students).

- Developed prototype of intuitive web-based environment for manipulation of virtual objects in fraction problems.

RESEARCH ASSISTANT

9/2005 – 6/2010

ELECTRICAL ENGINEERING & COMPUTER SCIENCE DEPT., VANDERBILT UNIVERSITY

Nashville, TN

Dissertation research and development in the Multi-agent Architecture for Coordinated Responsive Agents (MACRO) project.

- Designed a fair and efficient task allocation mechanism as a scalable testbed for the coordination and control of a global sensor web. Implemented testbed as a distributed agent framework in C++ with ACE/TAO/CIAO middleware.
- Designed and implemented a novel, decision-theoretic planning and scheduling algorithm for agents operating on shared computational nodes in resource-constrained environments, such as sensor webs or satellite constellations.
- Experimentation and analysis to verify the scalability and effectiveness of the integrated, adaptive system incorporating multi-agent task allocation and distributed planning and scheduling capabilities.

RESEARCH INTERN

LOCKHEED MARTIN ADVANCED TECHNOLOGY CENTER

Summer 2007

Palo Alto, CA

Collaborated on the development of autonomous agents for distributed, real-time embedded (DRE) systems like sensor networks.

- Designed and implemented (in C++) autonomous agent reasoning and communication protocols for efficient, coordinated operation on multiple, heterogeneous processing nodes in sensor networks.
- Integrated agents with adaptive resource management and software composition/configuration planning services. Implemented in C++ with ACE/TAO/CIAO and deployed across a combination of Linux and Windows platforms.

RESEARCH INTERN

LOCKHEED MARTIN ADVANCED TECHNOLOGY LABORATORIES

Summer 2006

Cherry Hill, NJ

Collaborated on the development of a flexible, state-of-the-art resource allocation testbed in the Distributed Processing Lab.

- Designed and implemented (in C++) a framework for construction and testing of novel algorithms in distributed system resource allocation with additional (non-resource) constraints.
- Implemented both multi-dimensional bin-packing and constraint-satisfaction techniques in a single, intelligent solution search, using a combination of heuristics for the bin packing and constraint satisfaction aspects of the problem.

PEER-REVIEWED JOURNAL PUBLICATIONS AND BOOK CHAPTERS

Kinnebrew, J.S., Segedy, J.R., & Biswas, G. (In Press). Integrating Model-Driven and Data-Driven Techniques for Analyzing Learning Behaviors in Open-Ended Learning Environments. *IEEE Transactions on Learning Technologies*.

Kinnebrew, J.S., Killingsworth, S.S., Clark, D.B., Biswas, G., Sengupta, P., Minstrell, J., Martinez-Garza, M., & Krinks, K. (In Press). Contextual Markup and Mining in Digital Games for Science Learning: Connecting Player Behaviors to Learning Goals. *IEEE Transactions on Learning Technologies*.

Basu, S., Sengupta, P., Dicks, A.C., Biswas, G., **Kinnebrew, J.S.**, & Clark, D.B. (In Press). Identifying Middle School Students' Challenges in Computational Thinking-Based Science Learning. *Educational Technology Research & Development*.

Caglar, F., Shekhar, S., Gokhale, A., Basu, S., Rafi, T., **Kinnebrew, J.S.**, & Biswas, G. (In Revision). Cloud-hosted Simulation-as-a-Service for High School STEM Education. *Simulation Modelling Practice and Theory*.

Segedy, J.R., **Kinnebrew, J.S.**, & Biswas, G. (2015). Using Coherence Analysis to Characterize Self-Regulated Learning Behaviours in Open-Ended Learning Environments. *Journal of Learning Analytics*, 2(1): 13-48.

Kinnebrew, J.S., Segedy, J.R., & Biswas, G. (2014). Analyzing the Temporal Evolution of Students' Behaviors in Open-Ended Learning Environments. *Metacognition and Learning*, 9(2): 187-215.

Biswas, G., Segedy, J.R., & **Kinnebrew, J.S.** (2014). A Combined Theory- and Data-Driven Approach for Interpreting Learners' Metacognitive Behaviors in Open-Ended Tutoring Environments. In *Design Recommendations for Adaptive Intelligent Tutoring Systems: Adaptive Instructional Strategies, Vol 2*.

Kinnebrew, J.S., Loretz, K.M., and Biswas, G. (2013). A Contextualized, Differential Sequence Mining Method to Derive Students' Learning Behavior Patterns. *Journal of Educational Data Mining*, 5(1): 190-219.

Kinnebrew, J.S., Biswas, G., Sulcer, B., and Taylor, R.S. (2013). Investigating Self-Regulated Learning in Teachable Agent Environments, In Azevedo, R. and Alevin, V. (Eds.), *International Handbook of Metacognition and Learning Technologies: Vol. 26. Springer International Handbooks of Education*. pp. 451-470. New York: Springer.

Sengupta, P., **Kinnebrew, J.S.**, Basu, S., Biswas, G., and Clark, D. (2013). Integrating Computational Thinking with K-12 Science Education Using Agent-based Computation: A Theoretical Framework, *Education and Information Technologies*, 18(2): 351-380.

Segedy, J.R., **Kinnebrew, J.S.**, and Biswas, G. (2013). The Effect of Contextualized Conversational Feedback in a Complex Open-ended Learning Environment, *Educational Technology Research and Development*, 61(1): 71-89.

Kinnebrew, J.S. and Biswas, G. (2011). Modeling and Measuring Self-Regulated Learning in Teachable Agent Environments, *Journal of e-Learning and Knowledge Society*, 7(2): 19-35.

Biswas, G., Jeong, H., **Kinnebrew, J.S.**, Sulcer, B., and Roscoe, R. (2010). Measuring Self-regulated Learning Skills through Social Interactions in a Teachable Agent Environment, *Research and Practice in Technology-Enhanced Learning (RPTEL)*, 5(2): 123-152.

Shankaran, N., **Kinnebrew, J.S.**, Koutsoukos, X., Lu, C., Schmidt, D.C., and Biswas, G. (2009). An Integrated Planning and Adaptive Resource Management Architecture for Distributed Real-time Embedded Systems, *IEEE Transactions on Computers: Special Issue on Autonomic Network Computing*, 58(11): 1485-1498.

PEER-REVIEWED CONFERENCE PUBLICATIONS

- Kinnebrew, J.S.**, Gauch, B., Segedy, J.R., & Biswas, G. (2015). Studying Student Use of Self-Regulated Learning Tools in an Open-Ended Learning Environment. In *Proceedings of the 17th International Conference on Artificial Intelligence in Education*. Madrid, Spain.
- Segedy, J.R., **Kinnebrew, J.S.**, & Biswas, G. (2015). Coherence over Time: Understanding Day-to-Day Changes in Students' Open-Ended Problem-Solving Behaviors. In *Proceedings of the 17th International Conference on Artificial Intelligence in Education*. Madrid, Spain.
- Ye, C., **Kinnebrew, J.S.**, Segedy, J.R., & Biswas, G. (2015). Learning Behavior Characterization with Multi-Feature, Hierarchical Activity Sequences. In *Proceedings of the 8th International Conference of Educational Data Mining*. Madrid, Spain.
- Ye, C., **Kinnebrew, J.S.**, Biswas, G., Evans, B.J., Fisher, D.H., Narasimham, G., & Brady, K.A. (2015). Behavior Prediction in MOOCs using Higher Granularity Temporal Information. In *Proceedings of the Second (2015) ACM Conference on Learning @ Scale*. ACM, New York, NY, USA, pp. 335-338.
- Niggemann, O., Biswas, G., **Kinnebrew, J.S.**, Khorasgani, H., Volgmann, S., Bunte, A. (2015). Data-Driven Monitoring of Cyber-Physical Systems Leveraging on Big Data and the Internet-of-Things for Diagnosis and Control. In *Proceedings of The 26th International Workshop on the Principles of Diagnosis (DX)*. Paris, France.
- Basu, S., Biswas, G., **Kinnebrew, J.S.**, & Rafi, T.H. (2015). Relations between Modeling Behavior and Learning in a Computational Thinking-Based Science Learning Environment. In *Proceedings of the 23rd International Conference on Computers in Education*. Hangzhou, China.
- Basu, S., **Kinnebrew, J.S.**, Shekhar, S., Calgar, F., Rafi, T.H., Biswas, G., & Gokhale, A. (2015). Collaborative Problem Solving using a Cloud-based Infrastructure to Support High school STEM Education. In *Proceedings of the 122nd ASEE Annual Conference*. Seattle, WA, USA.
- Segedy, J.R., **Kinnebrew, J.S.**, Goldberg, B.S., Sottolare, R.A., & Biswas, G. (2015). Designing Representations and Support for Metacognition in the Generalized Intelligent Framework for Tutoring. In *Proceedings of the 17th International Conference on Human-Computer Interaction*. Los Angeles, CA, USA.
- Kinnebrew, J.S.**, Mack, D.L.C., Biswas, G., & Chang, C.K. (2014). A Differential Approach for Identifying Important Student Learning Behavior Patterns with Evolving Usage over Time. In *Proceedings of the Mobile Sensing, Mining and Visualization for Human Behavior Inference Workshop at The 18th Pacific-Asia Conference on Knowledge Discovery and Data Mining*. Tainan, Taiwan.
- Ye, C., **Kinnebrew, J.S.**, & Biswas, G. (2014). Mining and Identifying Relationships among Sequential Patterns in Multi-Feature, Hierarchical Learning Activity Data. In *Proceedings of the 7th International Conference on Educational Data Mining*. London, UK.
- Biswas, G., **Kinnebrew, J.S.**, Segedy, J.R. (2014). Using a Cognitive/Metacognitive Task Model to analyze Students Learning Behaviors. In *Proceedings of the 16th International Conference on Human-Computer Interaction*. Heraklion, Crete, Greece.
- Basu, S., **Kinnebrew, J.S.**, & Biswas, G. (2014). Assessing student performance in a computational-thinking based environment for learning science. In *Proceedings of the 12th International Conference on Intelligent Tutoring Systems*. pp. 476-481. Honolulu, Hawaii, USA.
- Basu, S., Dukeman, A., **Kinnebrew, J.S.**, Biswas, G., & Sengupta, P. (2014). Investigating student generated computational models of science. In *Proceedings of the 11th International Conference of the Learning Sciences* (pp. 1097-1101). Boulder, CO, USA.
- Dukeman, A., Shekhar, S., Caglar, F., Gokhale, A., Biswas, G., & **Kinnebrew, J.S.** (2014). Analyzing Students' Computational Models as they Learn in STEM Disciplines. In *Proceedings of the 121st American Society for Engineering Education Annual Conference*. Indianapolis, IN.
- Shekhar, S., Caglar, F., Dukeman, A., Hou, L., Gokhale, A., **Kinnebrew, J.S.**, & Biswas, G. (2014). A Collaborative K-12 STEM Education Framework Using Traffic Flow as a Real-world Challenge Problem. In *Proceedings of the 121st American Society for Engineering Education Annual Conference*. Indianapolis, IN.

- Biswas, G., **Kinnebrew, J.S.**, & Mack, D.L.C. (2013). How do students' learning behaviors evolve in scaffolded open-ended learning environments? In *Proceedings of the 21st International Conference on Computers in Education*. Bali, Indonesia. (***Recipient of the Best Paper Award**)
- Biswas, G., **Kinnebrew, J.S.**, and Segedy, J.R. (2013). Analyzing Students' Metacognitive Strategies in Open-Ended Learning Environments. In M. Knauff, M. Pauen, N. Sebanz, & I. Wachsmuth (Eds.) *Proceedings of the 35th Annual Conference of the Cognitive Science Society* (pp. 209-214). Austin TX: Cognitive Science Society.
- Kinnebrew, J.S.**, Mack, D.L.C., and Biswas, G. (2013). Mining Temporally-Interesting Learning Behavior Patterns. In *Proceedings of the 6th International Conference on Educational Data Mining*. Memphis, TN, USA, July 6-9, 2013.
- Basu, S., Dickes, A., **Kinnebrew, J.S.**, Sengupta, P., and Biswas, G. (2013). CTSiM: A Computational Thinking Environment for Learning Science through Simulation and Modeling. In *Proceedings of the 5th International Conference on Computer Supported Education*. pp. 369-378. Aachen, Germany.
- Biswas, G., Segedy, J.R., and **Kinnebrew, J.S.** (2013). Smart Open-Ended Learning Environments that Support Learners' Cognitive and Metacognitive Processes. In A. Holzinger and G. Pasi (Eds.) *Human-Computer Interaction and Knowledge Discovery in Complex, Unstructured, Big Data, LNCS 7947* (pp. 303-310). Springer-Verlag Berlin Heidelberg.
- Dukeman, A., Caglar, F., Shekhar, S., **Kinnebrew, J.S.**, Biswas, G., Fisher, D., and Gokhale, A. (2013). Teaching Computational Thinking Skills in C3STEM with Traffic Simulation. In A. Holzinger and G. Pasi (Eds.) *Human-Computer Interaction and Knowledge Discovery in Complex, Unstructured, Big Data, LNCS 7947* (pp. 350-357). Springer-Verlag Berlin Heidelberg.
- Biswas, G., **Kinnebrew, J.S.**, and Segedy, J.R. (2012). Modeling student behaviors in an open-ended learning environment. In V. G. Duffy (Ed.), *Advances in Applied Human Modeling and Simulation*. pp. 202-211. San Francisco, CA, USA: CRC Press.
- Basu, S., **Kinnebrew, J.S.**, Dickes, A., Farris, A.V., Sengupta, P., Winger, J. and Biswas, G. (2012). A Science Learning Environment using a Computational Thinking Approach. In *Proceedings of the 20th International Conference on Computers in Education (ICCE 2012)*. pp. 722-729. Singapore, November 26-30, 2012. (***Recipient of the Best Student Paper Award**)
- Biswas, G., **Kinnebrew, J.S.**, and Segedy, J.R. (2012). Analyzing Student Learning and Metacognitive Processes in a Choice-Rich Science Learning Environment. In the *Proceedings of the 5th Biennial Meeting of the EARLI Special Interest Group on Metacognition*. Milano, Italy.
- Segedy, J.R., **Kinnebrew, J.S.**, and Biswas, G. (2012). Supporting Student Learning using Conversational Agents in a Teachable Agent Environment, In *Proceedings of the International Conference of the Learning Sciences (ICLS 2012)*. Sydney, Australia, July 2-6, 2012.
- Kinnebrew, J.S.** and Biswas, G. (2012). Identifying Learning Behaviors by Contextualizing Differential Sequence Mining with Action Features and Performance Evolution. In *Proceedings of the 5th International Conference on Educational Data Mining (EDM 2012)*. Chania, Greece, June 19-21, 2012. (***Recipient of the Best Paper Award**)
- Bouchet, F. **Kinnebrew, J.S.**, Biswas, G., and Azevedo, R. (2012). Identifying Students' Characteristic Learning Behaviors in an Intelligent Tutoring System Fostering Self-Regulated Learning. In *Proceedings of the 5th International Conference on Educational Data Mining (EDM 2012)*. Chania, Greece, June 19-21, 2012.
- Segedy, J.R., **Kinnebrew, J.S.**, and Biswas, G. (2012). Relating Student Performance to Action Outcomes and Context in a Complex, Choice-Rich Learning Environment. In *Proceedings of the 11th International Conference on Intelligent Tutoring Systems (ITS 2012)*. Chania, Greece, June 14-18, 2012.
- Sengupta, P., **Kinnebrew, J.S.**, Biswas, G., and Clark, D. (2012). Integrating Computational Thinking with K-12 Science Education: A Theoretical Framework, In *Proceedings of the International Conference on Computer Supported Education (CSEDU 2012)*. pp. 40-49. Porto, Portugal, April 16-18, 2012.
- Segedy, J.R., **Kinnebrew, J.S.**, and Biswas, G. (2011). Modeling Learner's Cognitive and Metacognitive Strategies in an Open-Ended Learning Environment, In *Papers from the AAAI Fall Symposium on Advances in Cognitive Systems*. Arlington, VA.
- Kinnebrew, J.S.**, Biswas, G., and Sulcer, B. (2010). Modeling and Measuring Self-Regulated Learning in Teachable Agent Environments, In *Papers from the AAAI Fall Symposium on Cognitive and Metacognitive Educational Systems (MCES 2010)*. FS-10-01, pp. 34-39, Arlington, VA, November 11-13, 2010.
- Zander, J., Mosterman, P.J., **Kinnebrew, J.S.**, and Biswas, G. (2010). Computation of Things for Human Protection and Fulfillment, *Proceedings of the IEEE International Conference on Homeland Security Technologies (IEEE HST 2010)*, Waltham, MA, November 8-10, 2010.

Kinnebrew, J.S., Mack, D.L.C., Biswas, G., and Schmidt, D.C. (2010). Coordination of Planning and Scheduling Techniques for a Distributed, Multi-level, Multi-agent System, *The International Conference on Agents and Artificial Intelligence (ICAART 2010)*, Valencia, Spain, January 22-24, 2010.

Kinnebrew, J.S. and Biswas, G. (2009). Efficient Allocation of Hierarchically-Decomposable Tasks in a Sensor Web Contract Net, *The IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT 2009)*, Milan, Italy, September 15-18, 2009.

Kinnebrew, J.S., Otte, W.R., Shankaran, N., Biswas, G., and Schmidt, D.C. (2009). Intelligent Resource Management and Dynamic Adaptation in a Distributed Real-time and Embedded Sensor Web System, *The 12th International Symposium on Object/Component/Service-oriented Real-time Distributed Computing (ISORC 2009)*, Tokyo, Japan, March 17-20, 2009.

Otte, W.R., **Kinnebrew, J.S.**, Schmidt, D.C., and Biswas, G. (2009). A Flexible Infrastructure for Distributed Deployment in Adaptive Sensor Webs, *The 2009 IEEE Aerospace Conference, Big Sky, Montana*, March 7-14, 2009.

Otte, W.R., **Kinnebrew, J.S.**, Schmidt, D.C., Biswas, G., and Suri, D. (2008). Application of Middleware and Agent Technologies to a Representative Sensor Network, *The Eighth Annual NASA Earth Science Technology Conference*, College Park, Maryland, June 24-26, 2008.

Roy, N., **Kinnebrew, J.S.**, Shankaran, N., Biswas, G., and Schmidt, D.C. (2008). Toward Effective Multi-capacity Resource Allocation in Distributed Real-time and Embedded Systems, *The 11th IEEE International Symposium on Object/Component/Service-oriented Real-time Distributed Computing (ISORC 2008)*, Orlando, Florida, May 5-7, 2008.

Shankaran, N., **Kinnebrew, J.S.**, Koutsoukos, X., Lu, C., Schmidt, D.C., and Biswas, G. (2008). Towards an Integrated Planning and Adaptive Resource Management Architecture for Distributed Real-time Embedded Systems, *Proceedings of the Workshop on Adaptive and Reconfigurable Embedded Systems (APRES) at The 14th IEEE Real-Time and Embedded Technology and Applications Symposium*, St. Louis, MO, United States, April 22-24, 2008.

Kinnebrew, J.S., Biswas, G., Shankaran, N., Schmidt, D.C., and Suri, D. (2007). Integrating Task Allocation, Planning, Scheduling, and Adaptive Resource Management to Support Autonomy in a Global Sensor Web, *The NASA Science Technology Conference*, College Park, Maryland, June 19-21, 2007.

Kinnebrew, J.S., Gupta, A., Shankaran, N., Biswas, G., and Schmidt, D.C. (2007). A Decision-Theoretic Planner with Dynamic Component Reconfiguration for Distributed Real-Time Applications, *The 8th International Symposium on Autonomous Decentralized Systems (ISADS 2007)*, Sedona, Arizona, March 21-23, 2007.

Suri, D., Howell, A., Schmidt, D.C., Biswas, G., **Kinnebrew, J.S.**, Otte, W.R., and Shankaran, N. (2007). A Multi-agent Architecture for Smart Sensing in the NASA Sensor Web, *The 2007 IEEE Aerospace Conference, Big Sky, Montana*, March 3-10, 2007.

Kinnebrew, J.S., Shankaran, N., Biswas, G., and Schmidt, D.C. (2007). A Decision-Theoretic Planner with Dynamic Component Reconfiguration for Distributed Real-time and Embedded Systems, *Proceedings of the Workshop on Artificial Intelligence for Space Applications at IJCAI 2007*, Hyderabad, India, January 6-12, 2007.

Suri, D., Howell, A., Shankaran, N., **Kinnebrew, J.S.**, Otte, W.R., Schmidt, D.C., and Biswas, G. (2006). Onboard Processing using the Adaptive Network Architecture, *The Sixth Annual NASA Earth Science Technology Conference*, College Park, Maryland, June 27-29, 2006.

PEER-REVIEWED WORKSHOP PAPERS, CONFERENCE PRESENTATIONS, & POSTERS

Segedy, J.R., **Kinnebrew, J.S.**, & Biswas, G. (2015). Using GIFT to Support Students' Understanding of the UrbanSim Counter Insurgency Simulation. In *Proceedings of the Workshop on Developing a Generalized Intelligent Framework for Tutoring (GIFT) at the 17th International Conference on Artificial Intelligence in Education*. Madrid, Spain.

Segedy, J.R., **Kinnebrew, J.S.**, Goldberg, B.S., Sottolare, R.A., & Biswas, G. (2015). Using GIFT to Model and Support Students' Metacognition in the UrbanSim Open-Ended Learning Environment. In *Proceedings of the 3rd Annual GIFT Users Symposium (GIFTSym3)*. Orlando, FL, USA.

Kinnebrew, J.S., Mack, D.L.C., and Biswas, G. (2013). A Differential Temporal Interestingness Measure for Identifying the Learning Behavior Effects of Scaffolding. In *Proceedings of the Workshop on Scaffolding in Open-Ended Learning Environments at the 16th International Conference on Artificial Intelligence in Education*. Memphis, TN, USA.

Clark, D.B., Killingsworth, S., Martinez-Garza, M., Van Eaton, G., Biswas, G., **Kinnebrew, J.S.**, Sengupta, P., Krinks, K., Adams, D., Zhang, H., & Hughes, J. (2013). Digital Games and Science Learning: Design Principles and Processes to Augment Commercial Game Design Conventions. In *Proceedings of the Workshop on Scaffolding in Open-Ended Learning Environments at the 16th International Conference on Artificial Intelligence in Education*. Memphis, TN, USA.

Khosravifar, B., Azevedo, R., Feyzi-Behnagh, R., Taub, M., Biswas, G., & **Kinnebrew, J.S.** (2013). Adaptive Multi-Agent Architecture to Track Students' Self-Regulated Learning. In *Proceedings of the Workshop on Scaffolding in Open-Ended Learning Environments at the 16th International Conference on Artificial Intelligence in Education*. Memphis, TN, USA.

Clark, D.B., Krinks, K., **Kinnebrew, J.S.**, Sengupta, P., Hughes, J., Martinez-Garza, M., Killingsworth, S., Biswas, G., Van Eaton, G., & Zhang, H. (2013). Design Matters: Research on Game Design for Science Learning. Poster presented at the *National Association of Research in Science Teaching (NARST) 2013 meeting*. Rio Grande, Puerto Rico.

Biswas, G., **Kinnebrew, J.S.**, & Segedy, J.R. (2012). Analyzing Student Learning and Metacognitive Processes in a Choice-Rich Science Learning Environment. The *5th Biennial Meeting of the EARLI Special Interest Group on Metacognition*. Milano, Italy.

Clark, D.B., Martinez-Garza, M., Hughes, J., Krinks, K., **Kinnebrew, J.S.**, Sengupta, P., Biswas, G., & Barrett, J. (2012). Beyond Good and Evil: Game design for explicit articulation of mental models. Presentation at invited symposium at the *National Association of Research in Science Teaching 2012 Meeting*. Indianapolis, IN. March, 2012.

Kinnebrew, J.S. and Biswas, G. (2011). Comparative Action Sequence Analysis with Hidden Markov Models and Sequence Mining, In *Proceedings of The Knowledge Discovery in Educational Data Workshop at the 17th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2011)*. San Diego, CA, August, 2011.

Segedy, J.R., **Kinnebrew, J.S.**, and Biswas, G. (2011). Investigating the Relationship between Dialogue Responsiveness and Learning in a Teachable Agent Environment. In G. Biswas and S. Bull (Eds.), *Proceedings of the 15th International Conference on Artificial Intelligence in Education (AIED 2011)*. Auckland, New Zealand, July, 2011.

PROFESSIONAL SERVICE

Peer reviewer for journals, including the *International Journal of Artificial Intelligence in Education*, *IEEE Transactions on Learning Technologies*, *Data and Knowledge Engineering Journal*, and *IEEE Transactions on Emerging Topics in Computing*.

Program committee member and peer reviewer for conferences, including the *International Joint Conference on Artificial Intelligence*, *AAAI Conference on Artificial Intelligence*, *International Conference on Artificial Intelligence in Education*, *International Conference on Educational Data Mining*, and *International Conference on Computer Supported Education*.

Guest lecturer in Vanderbilt Computer Science courses, including *CS 360 – Advanced Artificial Intelligence*, *CS 274 – Modeling and Simulation*, and *CS 278 – Principles of Software Engineering*.

Member of the *ACM SIGKDD*, *IEDM Society*, *IAIED Society*, and *Cognitive Science Society*.