

Curriculum Vitae for Prof. Bruce Martin McLaren

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PROFESSIONAL BIO

Prof. Bruce M. McLaren is an Associate Research Professor at Carnegie Mellon University and the current President of the International Society for Artificial Intelligence in Education (2017-2019). McLaren is passionate about how technology can support education and has dedicated his work and research to projects that explore how students can learn with educational games, intelligent tutoring systems, e-learning principles, and collaborative learning technology. McLaren's research with educational games, for instance, has shown that students can learn decimals better by playing a web-based educational game than by using more conventional technology. McLaren's research with intelligent tutors investigates how students learn when presented with erroneous examples in conjunction with intelligent tutors on the web: <http://www.cs.cmu.edu/~bmclaren/projects/AdaptErrEx/>. Prof. McLaren has also investigated how erroneous examples can work synergistically with educational games to help students learn (http://www.nsf.gov/awardsearch/showAward?AWD_ID=1238619). Additionally, McLaren has conducted a series of experiments investigating how chemistry students learn when presented with worked examples, in conjunction with intelligent tutors, as well as polite hints and feedback (See the project page: <https://stoichtutor.cs.cmu.edu/>). Finally, Prof. McLaren has a keen interest in and experience with collaborative learning and technology for supporting and analyzing collaborative argumentation. Prof. McLaren has researched and developed educational technology using AI techniques to help teachers moderate collaborative e-Discussions and online arguments (See the project LASAD (<http://cses.informatik.hu-berlin.de/research/details/lasad/>)). Prof. McLaren has over 150 publications (31 journal articles) spanning peer-reviewed journals, conferences, workshops, symposiums and book chapters.

Prof. McLaren also has over 20 years experience in the commercial sector, applying research ideas to practical problems using Artificial Intelligence techniques. For instance, as Director of Research at OpenWebs Corporation from 2000 to 2002, he led a group of engineers in the development of an inter-company (B2B) trading product. He was also the project leader of many expert system projects during his 10+ year tenure with Carnegie Group, Inc.

EDUCATION

Ph.D., Artificial Intelligence (Intelligent Systems Program), 1999

Dissertation Title: *Assessing the Relevance of Cases and Principles Using Operationalization Techniques*,
University of Pittsburgh

Ph.D. Committee: Dr. Kevin Ashley (chair): Professor of Intelligent Systems, Senior Scientist at Univ. of Pitt.
Dr. Manuela Veloso: Current President of AAAI; Herbert A. Simon Prof. of C.S. at CMU
Dr. Bruce Buchanan: Past President of AAAI; Inventor of the Mycin program; Retired
Dr. Martha Pollack: Past President of AAAI; Prof. of C.S. and Engineering at U. of Mich.
(Note: All committee members are elected members of the prestigious AAAI Fellows)

M.S., Artificial Intelligence (Intelligent Systems Program), 1994

University of Pittsburgh

M.S., Computer Science, 1984

University of Pittsburgh

B.S., Computer Science, *Cum Laude*, 1981

Millersville University of Pennsylvania

SUMMARY OF PROFESSIONAL EXPERIENCE

Carnegie Mellon University	Pittsburgh, Pa. Human-Computer Interaction Institute Associate Research Professor (Promoted in 2015) Senior Systems Scientist (Promoted in 2009) Systems Scientist	June 2003 – Present
Saarland University	Saarbrücken, Germany Center for e-Learning Technology (CeLTech) Adjunct Principal Researcher	Sept. 2010 – June 2013
German Research Center for Artificial Intelligence (Deutsches Forschungszentrum für Künstliche Intelligenz – DFKI)	Saarbrücken, Germany Competence Center for e-Learning Visiting Senior Researcher	July 2006 – Aug 2010
Carnegie Mellon University	Pittsburgh, Pa. Institute for Software Research, International Adjunct Systems Scientist	Sept. 2002 – May 2003
OpenWebs Corporation (Later CarParts Technology)	Pittsburgh, Pa. Director, eCommerce Technologies Director, Research and Development (Promoted 2001) Manager, Intelligent Trading Technologies	May 2000 - Nov. 2002
The IBM Transarc Laboratory	Pittsburgh, Pa. Technical Consultant (Independent)	Mar. 1999 - Feb. 2000
MAYA Design Group	Pittsburgh, Pa. Technical Consultant (Independent)	Aug. 1998 - Feb. 1999
Carnegie Group, Inc.	Pittsburgh, Pa. Project Manager (Promoted in 1996) Senior Engineer	Dec. 1989 - May 1998
Carnegie (U.K.) Limited	Ascot, England Senior Consultant	Sept. 1986 - Dec. 1989
Carnegie Mellon University	Pittsburgh, Pa. Project Supervisor (Promoted in 1986) Research Programmer	Jan. 1985 - Sept. 1986
General Electric	Erie, Pa. Computer Programmer	Oct. 1981 - Dec. 1982

AWARDS AND RECOGNITION

- **President – International Society for Artificial Intelligence in Education.** Elected in December 2015. Serving from June 2017 until June 2019.
- **2018 Best Paper Award.** *Student learning benefits of a mixed-reality teacher awareness tool in AI-enhanced classrooms.* by Holstein, K., McLaren, B.M. & Aleven, V. In the *Proceedings of the 19th International Conference on Artificial Intelligence in Education (AIED 2018)* held in London, England.

- **2018 Best Student Paper Award.** *Informing the design of teacher awareness tools through causal alignment analysis.* In the *Proceedings of the 13th International Conference of the Learning Sciences (ICLS'18)* held in London, England.
- **2017 Best Poster Paper Award.** *Uncovering gender and problem difficulty effects in learning with an educational game* by McLaren, B.M., Farzan, R., Adams, D.M., Mayer, R.E., & Forlizzi, J. In the *Proceedings of the 18th International Conference on Artificial Intelligence in Education (AIED 2017)* held in Wuhan, China.
- **2016 Best Paper Award.** *Predicting individual differences for learner modeling in intelligent tutors from previous learner activities* by Eagle, M., Corbett, A., Stamper, J., McLaren, B. M., Baker, R., Wagner, A., MacLaren, B., & Mitchell, A. In the *Proceedings of the 24th Conference on User Modeling, Adaptation and Personalization (UMAP 2016)* held in Halifax, Canada.
- **2016 Finalist for the Best Paper Award.** *Estimating individual differences for student modeling in intelligent tutors from reading and pretest data* by Eagle, M., Corbett, A., Stamper, J., McLaren, B. M., Wagner, A., MacLaren, B., & Mitchell, A. In the *Proceedings of the 13th International Conference on Intelligent Tutoring Systems (ITS 2016)* held in Zagreb, Croatia.
- **2015 Best Poster Paper.** *Examples are more efficient for learning than high-assistance instructional software* by McLaren, B. M., van Gog, T., Ganoë, C., Yaron, D., & Karabinos, M. In the *Proceedings of 17th International Conference on Artificial Intelligence in Education (AIED 2015)* held in Madrid, Spain.
- **2014 Best Student Paper Award.** *Adaptive support versus alternating worked examples and tutored problems: Which leads to better learning?* Najar, A.S., Mitrovic, T. & McLaren, B.M. In the *Proceedings of the 21st International Conference on User Modeling, Adaptation and Personalization (UMAP 2014)* held in Aalborg, Denmark, July 7-11, 2014.
- **2006 Finalist for the Best Paper Award.** *Studying the Effects of Personalized Language and Worked Examples in the Context of a Web-Based Intelligent Tutor;* McLaren, B.M., Lim, S., Gagnon, F., Yaron, D., & Koedinger, K. R. In the *Proceedings of the 8th International Conference on Intelligent Tutoring Systems*, Jhongli, Taiwan, June 26-30, 2006.
- **2004 Best Paper Award.** *Toward Tutoring Help Seeking: Applying Cognitive Modeling to Meta-Cognitive Skills* by Aleven, V., McLaren, B.M., Roll, I. & Koedinger, K. R. In the *Proceedings of the 7th International Conference on Intelligent Tutoring Systems (ITS-2004)*. Maceio, Brazil.
- **1995 Most Distinguished Paper Award.** *Reasoning with Reasons in Case-Based Comparisons;* Ashley, K.D. & McLaren, B.M. In the *Proceedings of the First International Conference on Case-Based Reasoning*, 1995, Sesimbra, Portugal. Based on my 1994 Artificial Intelligence Masters project.

GRANTS

Awarded and Active

- *National Science Foundation (NSF), EHR Core Research (ECR).* PIs: Bruce M. McLaren, Ryan Baker (University of Pennsylvania), Jon Star (Harvard University), “Collaborative Research: Using Educational Data Mining Techniques to Uncover How and Why Students Learn from Erroneous Examples,” (CMU Portion: \$914,042) Period: 06/01/17 to 05/31/20. ([Read CMU HCII article about this grant](#))
- *U.S. Department of Education (IES),* PI: Sandra Katz, Co-PIs: Pamela Jordan, Patricia Albacete, Bruce M. McLaren, “Linking Dialogue and Student Modeling to Create an Enhanced Micro-Adaptive Tutoring System,” (Subcontract: \$571,470). Period: 09/01/15 to 08/31/18. (See the [Department of Education \(IES\) Announcement](#))
- *National Science Foundation (NSF), REAL Program,* PI: Bruce M. McLaren, Co-PIs: Aaron Mitchell, John Stamper, “Knowing What Students Know: Using Educational Data Mining to Predict Robust STEM Learning,” (\$1,487,345). Period: 09/01/14 to 08/31/18. (See the [NSF Award Announcement](#))

- *National Science Foundation (NSF), Cyberlearning*, PI: Vincent Alevan, Co-PI: Bruce M. McLaren, “EXP: Helping Teachers Help their Students’ Use of Intelligent Tutoring Software Analytics to Improve Student Learning,” (\$549,575) Period: 09/01/15 to 08/31/18. (See the [NSF Award Announcement](#))
- *Simon Initiative, ProSEED*. PI: Lauren Herckis, Co-PI: Bruce M. McLaren, “Deploying Educational Technology with Fidelity: Capitalizing on Research from Biomedicine,” (\$15,000) Period: 07/01/18 to 06/30/19.
- *Manufacturing Futures Initiative (MFI), Internal CMU Funding from the Mellon Foundation*. PI: Bruce M. McLaren, Co-PI: Matthew Travers, “Training for Mass Production: A Blueprint Project in the Food Industry,” (\$66,087) Period: 09/01/18 to 08/31/19. <https://engineering.cmu.edu/mfi/opportunities/research-proposals.html>
- *Manufacturing Futures Initiative (MFI), Internal CMU Funding from the Mellon Foundation*. PI: Jack Beuth, Co-PI: Bruce M. McLaren, “Training in Additive Manufacturing Using Entertainment and Tutoring Technologies,” (\$59,483) Period: 09/01/18 to 08/31/19. <https://engineering.cmu.edu/mfi/opportunities/research-proposals.html>

Pending

- *U.S. Department of Education (IES)*. PIs: Vincent Alevan, Bruce M. McLaren, Steve Ritter (Carnegie Learning, Inc.), “Enhancing Student Learning with an Orchestration Tool for Personalized Teacher-Student Interactions in Classrooms Using Intelligent Tutoring Software,” Submitted August 17, 2017. Proposed Period: 07/01/18 to 06/30/21.
- *Spencer Foundation*. PI: Lauren Herckis, Co-PI: Bruce M. McLaren, “Fidelity of Implementation (FOI) in Educational Technology: Leveraging Research from Biomedicine,” Submitted May 1, 2018. Proposed Period: 09/01/18 to 08/31/19.

Awarded and Completed

- *National Science Foundation (NSF), Small Business Technology Transfer (STTR)*, PI: Bruce M. McLaren, “LOGIC: Linkage Objects for Generalized Instruction in Coding,” (\$77,940) Subaward from Tutorgen, Inc. Period: 01/01/15 to 6/30/16.
- *ProSEED, Simon Seed Grant, Carnegie Mellon University*, PI: Bruce M. McLaren, Co-PI: Mara Harrell, “Can Collaborative Argument Diagramming Improve Students’ Understanding of Argumentation and Ability to Argue?” (\$20,000). Period: 07/01/14 to 08/31/16.
- *Singapore Management University*, PI: Bruce M. McLaren, Co-PI: Ken Koedinger “Intelligent Tutoring for Business Modelling Spreadsheets,” (\$120,000). Period: 01/01/14 to 06/30/15.
- *National Science Foundation (NSF), Transforming STEM Learning (TSL)*, Award No: DRL-1238619. PI: Bruce M. McLaren, Co-PI: Jodi Forlizzi, “Enhancing Mathematics Education with Educational Games: Can Erroneous Examples Help?” (\$510,518) Period: 10/01/12 to 03/31/15. (See http://www.nsf.gov/awardsearch/showAward?AWD_ID=1238619)
- *U.S. Department of Education (IES)*, PI: Michael Timms (WestEd), Co-PIs: Bruce M. McLaren, Douglas Weihnacht “Voyage to Galapagos: Development of a Differentiated Assistance Model in an Inquiry Learning Environment,” (Subcontract amount: \$237,812) Period: 03/01/11 to 02/28/14.
- *National Science Foundation (NSF)* Award No: SBE0354420. PI: Kenneth R. Koedinger, “Pittsburgh Sciences of Learning Center: Robust Learning with Learning Experiments in Real Classrooms.” McLaren was awarded this project under the learning center grant. “Worked Examples, Intelligently-Tutored Problems, Erroneous Examples, and Problems to Solve: Which Materials are Best for Different Levels of Learners?” PI: Bruce M. McLaren, Co-PIs: Dave Yaron, Tamara Van Gog (\$91,714). Period: 01/01/12 to 12/31/13. (See <http://www.cs.cmu.edu/~bmclaren/projects/StoichAd/> and <https://stoichtutor.cs.cmu.edu/>)
- *U.S. Department of Education (IES)*, Award No: R305A090460. PI: Bruce M. McLaren, “AdaptErrEx: Exploring the Learning Benefits of Erroneous Examples and Their Dynamic Adaptations Within the Context of

Middle School Mathematics,” (\$1,302,928). Period: 09/01/09 to 07/31/13 (including no-cost extension period). (See <http://www.cs.cmu.edu/~bmclaren/projects/AdaptErrEx/>)

- *European Commission, 7th Framework Programme on Research, Technological Development and Demonstration* (FP7-ICT-2009-5), PI: The Hebrew University of Jerusalem (Baruch Schwarz); Co-PIs: Saarland University (Bruce M. McLaren), Researchers from five other European institutions, “METAFORA - Learning to Learn Together: A Visual Language for Social Orchestration of Educational Activities,” (Subcontract amount: 230,000 Euros ≈ \$300,000) Period: 07/01/10 to 10/01/13. (See <http://www.metafora-project.org/>)
- *Deutsche Forschungsgemeinschaft* (DFG, the German Research Foundation), PIs: Bruce M. McLaren, Niels Pinkwart, “Learning to Argue: Generalized Support Across Domains (LASAD)” (Approximate funding over 4 years: 700,000 Euros ≈ \$1,000,000). Period: 11/01/08 to 10/31/12. (Notes: (1) There was an initial grant period of 2 years and then an extension of 2 years based on a new proposal. (2) Unlike U.S. grants, DFG allows equal PIs, as opposed to designating a single PI, so McLaren and Pinkwart are equal PIs.) (See <http://cses.informatik.hu-berlin.de/research/details/lasad/>)
- *Ministry of Education and Science of the Ukraine; National Aerospace University*, PI: Bruce M. McLaren; “Training of Dr. Andriy Chukhray on Intelligent Tutoring Systems and Studies of Learning,” (\$7,716). Period: 11/01/11 to 01/01/2012.
- *U.S. Department of Education* (IES), Award No: R305A080093. PI: Vincent Aleven, Co-PI: Bruce M. McLaren. “Bringing Cognitive Tutors to the Internet: A Website that Helps Middle-School Students Learn Math.” (\$1,490,705). Period: 03/01/08 to 04/30/11. (See <https://mathtutor.web.cmu.edu/>)
- *Deutsche Forschungsgemeinschaft* (DFG, the German Research Foundation), PIs: Erica Melis, Bruce M. McLaren, “Adaptive Learning with Erroneous Examples (ALoE)” (~\$250,000). Period: 09/01/08 to 08/31/10.
- *National Science Foundation* (NSF) Award No: 0627513. PI: Norman Sadeh, Co-PIs: Bruce M. McLaren, Lorrie Cranor, Ljudevit Bauer, and Jason Hong, “CT-T: User-Controllable Security and Privacy for Pervasive Computing.” (\$1,968,217). Period: 09/01/06 to 08/31/10.
- *Office of Naval Research* (ONR) Award No: N000140310220. PI: Kenneth R. Koedinger, Co-PIs: Neil Heffernan, Bruce M. McLaren, and Vincent Aleven. “Demonstrating Affordable Behavioral Modeling with CTAT Through Machine Learning and Human-Computer Interaction Techniques.” (\$887,362). Period: 12/01/05 to 11/30/08. (See <http://ctat.pact.cs.cmu.edu/>)
- *European Commission, Sixth Framework Programme IST – Technology-Enhanced Learning* (STREP Contract No. 027728), PI: The Hebrew University of Jerusalem; Co-PIs: DFKI (Bruce M. McLaren), Researchers from five other European institutions, “ARGUNAUT – An Intelligent Guide to Support Productive Online Dialogue,” Period: 12/01/05 to 08/31/08.
- *National Science Foundation* (NSF) Award No: SBE0354420. PI: Kenneth R. Koedinger, “Pittsburgh Sciences of Learning Center: Robust Learning with Learning Experiments in Real Classrooms.” Period: 10/01/04 to 09/30/14. McLaren was awarded the following learning center projects under this grant.
 - “Worked Examples, Intelligently-Tutored Problems, Erroneous Examples, and Problems to Solve: Which Materials are Best for Different Levels of Learners?” PI: Bruce M. McLaren, Co-PIs: Dave Yaron, Tamara van Gog (\$141,700). Period: 12/01/12 to 12/31/13. (See <https://stoichtutor.cs.cmu.edu/>)
 - “Exploring the Assistance Dilemma and Robust Learning in the Context of the Stoichiometry Tutors,” PI: Bruce M. McLaren, Co-PIs: Dave Yaron, Ken Koedinger (\$83,266). Period: 01/01/08 to 09/30/09. (See <https://stoichtutor.cs.cmu.edu/>)
 - “CTAT: Start-to-Finish Creation of Computer-Based Tutors Without Programming,” PI: Vincent Aleven, Co-PIs: Bruce M. McLaren, Jonathan Sewall (\$598,990). Period: 10/01/07 to 09/30/09. (See <http://ctat.pact.cs.cmu.edu/>)

- “Supporting Conceptual Learning in Chemistry through Collaboration Scripts and Adaptive, Online Support,” PI: Bruce M. McLaren, Co-PIs: Nikol Rummel, Andi Harrer, Hans Spada, Niels Pinkwart (\$169,122). Period: 01/01/07 to 06/30/08.
- “Improving Algebra Learning and Collaboration through Collaborative Extensions to the Algebra Cognitive Tutor,” PI: Bruce M. McLaren, Co-PIs: Nikol Rummel, Mindy Kalchman, Hans Spada (\$503,500). Period: 01/01/05 to 12/31/07.
- “CTAT: Authoring Tools and Services for Computer-Based Tutors in LearnLab Experiments and Courses,” PI: Vincent Aleven, Co-PIs: Bruce M. McLaren, Jonathan Sewall, John laPlante (\$428,528). Period: 10/01/06 to 09/30/07. (See <http://ctat.pact.cs.cmu.edu/>)
- “Studying the Learning Effect of Personalization and Worked Examples in the Solving of Stoichiometry Problems,” PI: Bruce M. McLaren, Co-PIs: Dave Yaron, Ken Koedinger (\$44,842). Period: 08/01/05 to 12/31/05. (See <https://stoichtutor.cs.cmu.edu/>)
- “CTAT: Tools to Author Intelligent and Pseudo-Intelligent Tutors: A PSLC Enabling Technology Proposal,” PI: Vincent Aleven, Co-PIs: Bruce M. McLaren, Jonathan Sewall (\$785,167). Period: 10/01/04 to 09/30/06. (See <http://ctat.pact.cs.cmu.edu/>)

INVITED PRESENTATIONS

- Keynote Speaker – e-Learning Korea 2018, Seoul, Korea “Classroom Orchestration: How Innovation and Artificial Intelligence are Impacting Education and Teaching”, To be delivered in September 14, 2018
- Invited talk - Universidad Técnica Federico Santa María, Valparaíso, Chile, “Addressing the Challenges of Education in a Technological World: How Learning Science is Leading the Way”, December 26, 2017 [[See announcement](#)]
- Invited talk - East China Normal University (ECNU), Shanghai, China, “Learning with Educational Games and Educational Technology Education at Carnegie Mellon University”, March, 2017 [[See announcement](#)]
- Keynote Speaker – 24th International Conference on Computers in Education IIT Bombay, India Nov 28th - Dec 2nd 2016, “Learning With Educational Games: Is it Just Hype or Supported by Evidence?”, *Watch the presentation:* <http://www.et.iitb.ac.in/icce2016/videos.html>
- Invited talk - Texas A&M, “How the Networked World, Our Understanding of Collaborative Learning, and Advanced Technology are Converging for New Learning Opportunities.” http://mediamatrix.tamu.edu/streams/523269/Frontier_Lecture_Series_-_4. November 12, 2014
- Invited Speaker – Wiley Faculty Network – Talks on adaptive educational technology and collaborative learning technology
 - March 13, 2014: <http://wiley.adobeconnect.com/p14g84909c8/>
 - March 10, 2014: <http://wiley.adobeconnect.com/p65xtnx7c2a/>
 - December 2, 2013: https://wiley.adobeconnect.com/_a44433639/p62qynch2cv/?launcher=false&fcsContent=true&pbMode=normal
- Keynote Speaker – 5th International Conference on Computer Supported Education (CSEDU 2013) in Aachen, Germany, “The Educational Software Gold Rush: How the Learning Sciences and Advanced Technology Can Lead the Way”, May 2013. *Watch the presentation:* <http://vimeo.com/insticc/review/80464552/8977e188e6>
- Invited talk - University of Sydney, School of Information Technologies, Basser Seminar Series. Sydney, Australia “Supporting Collaborative Learning and E-Discussions Using Artificial Intelligence Techniques,” (<http://sydney.edu.au/engineering/it/research/news/mclaren.shtml>) April 3, 2013
- Invited talk - University of Canterbury, Department of Computer Science and Software Engineering Symposium Lecture. Christchurch, New Zealand, “Supporting Collaborative Learning and E-Discussions

Using Artificial Intelligence Techniques,”

(<http://www.cosc.canterbury.ac.nz/open/seminars/open/abstracts/496.html>) March 20, 2013

- Invited talk - Millersville University's Department of Computer Science Fall 2012 Symposium Lecture, “The Educational Software Gold Rush: How Can the Learning Sciences Help?” (<http://cs.millersville.edu/activities/symposium/fall2012>) November 26, 2012
- CSCL-2009 symposium “The Assistance Dilemma in CSCL,” Rhodes, Greece, June 2009. Talk titled “Adapting Assistance to the Student(s): Preliminary Ideas from Individual and Collaborative Computer-Supported Learning Contexts”
- Kaleidoscope Symposium, Oberhausen, Germany, July 2006. Title of talk: “The Pittsburgh Science of Learning Center: Learning Studies and Technology in Actual Classroom Settings.” A video of this talk is available at http://www.noe-kaleidoscope.org/pub/lastnews/symposium_2005/mclaren.html
- GE Research, Albany, New York, February 2003.
- Robert Gordon University, Aberdeen, Scotland, February 2003.
- Fraunhofer Institute, Berlin, Germany, February 2003.
- University of Edinburgh, Edinburgh, Scotland, February 2003.

PARTICIPATION WITH ACADEMIC ORGANIZATIONS, CONFERENCES, WORKSHOPS, SEMINARS, AND JOURNALS

- President – International Society for Artificial Intelligence in Education. Elected in December 2015. Serving from June 2017 until June 2019.
- Conference Co-Chair of the [*19th International Conference on Artificial Intelligence in Education \(AIED 2018\)*](#). London, England, June 2018.
- Program Co-Chair of the [*10th International Conference on Computer Supported Education \(CSEDU 2018\)*](#). Madeira, Portugal, March 2018.
- Conference Chair of the [*9th International Conference on Computer Supported Education \(CSEDU 2017\)*](#). Porto, Portugal, April 2017.
- Honorary Conference Chair of the [*8th International Conference on Computer Supported Education \(CSEDU 2016\)*](#). Rome, Italy, April 2016.
- Elected to the Executive Committee of the International Artificial Intelligence in Education Society in October 2011, for a six-year term, 2012-2017.
- Conference Co-Chair of the *7th International Conference on Educational Data Mining (EDM-2014)* held in London, England, July 2014.
- Co-Chair, Poster Organization of the *16th International Conference on Artificial Intelligence in Education (AIED 2013)*, Memphis, July 2013.
- Co-Chair, Local Organization of *Intelligent Tutoring Systems 2010 (ITS-2010)*, Pittsburgh, June 2010.
- Workshop Chair for the *Fifth International Conference on Electronic Commerce (ICEC 2003)*, Pittsburgh, PA - October 1-3, 2003.
- Journal Contributions:
 - Co-Editor, along with Sergey Sosnovsky and Vincent Aleven: *Landmark Learning Systems and New Ideas and Developments in Mathematics and Science Learning* published as two special issues (Part 1 and Part 2) of the *International Journal of Artificial Intelligence in Education (IJAIED)* in 2014.

- Co-Editor, along with Bert Bredeweg and Gautum Biswas of: *Learning Systems for Science and Technology Education*. Published by *IEEE Transactions on Learning Technologies (TLT)* as a Special Section, JULY-SEPTEMBER 2013 (Vol. 6, No. 3) pp. 194-196 © IEEE Computer Society.
- Co-Editor, along with Niels Pinkwart, e-Book: *Educational Technologies for Teaching Argumentation Skills*, to be published in 2012 by Bentham Science Publishers.
- On the Editorial Board of the *Journal of Educational Data Mining (JEDM)* since November 2008.
- Co-Organizer of the following workshops and seminars:
 - Workshop: “Intelligent Support for Exploratory Environments: Exploring, Collaborating, and Learning Together” Part of ITS-2012, Crete, Greece, June 2012. (Co-Organizers: Toby Dragon, Manolis Mavrikis, Sergio Gutiérrez Santos)
 - Seminar on *Technology-Enhanced Learning for Mathematics and Science (TELMAS): Landmark Research and New Contributions*. Part of EC-TEL 2011, Palermo, Italy, September 21, 2011. (Co-Organizers: Sergey Sosnovsky, Christoph Igel, Joerg Siekmann)
 - Workshop: “CSCL Argumentation Systems: How Do Empirical Results and Emerging Technologies Inform System Development?” Part of CSCL 2009, Rhodes, Greece, June, 2009. (Co-Organizers: Niels Pinkwart, Oliver Scheuer, Frank Loll)
- On program committee and/or reviewer for the following conferences and workshops:
 - AIED-2017 (Senior program member), AIED-2015 (Senior program member), AIED-2013 (Senior program member), LAK-2013, CSEDU-2013, EDM-2012, Workshop *Intelligent Support for Learning in Groups* (ITS-2012), AIED-2011, CSCL-2011, FLAIRS-2009 *Special Track on Artificial Intelligence Education*, AIED-2009, EDM-2008, FLAIRS-2008 *Special Track on Intelligent Tutoring Systems*, *Workshop on Intelligent Tutoring Systems in Ill-Defined Domains* (ITS-2008), AIED-2007, ECCBR-2006, IJCAI-2005, ICCBR-2005, *Second Workshop on Agent-based Computing for Enterprise Collaboration* (ACEC), ECCBR-2004, ICCBR-2003, AAI-2002 *Workshop on Agent-Based Technologies for B2B E-Commerce*, ICCBR-2001

ADVISEES

- **Post-Docs:** Michael Mogessie Ashenafi (2018-Present); J. Elizabeth Richey (2018-Present); Irene Chounta (2016-2018); Toby Dragon (2011-2013); Seiji Isotani (2009-2011)
- **PhD Students:** Kenneth Holstein (2016-Present, on PhD committee); Oliver Scheuer (Saarland University PhD completed in 2015, co-advisor); Amir Najjar (University of Canterbury, PhD completed in 2014, co-advisor); Marieke Peeters (Utrecht University, PhD completed in 2014, on committee); Dimitra Tsovaltzi (Saarland University, PhD completed in 2010, on committee)
- **Masters Students:** Anahuac Valero (Saarland University 2013); Ugur Kira (Saarland University 2012); Hina Minzur (Saarland University 2011); Alexander Borek (Karlsruhe Institute of Technology 2009); Jan Mikšátko (Charles University 2007)

PUBLICATIONS

Journal Articles (31)

- McLaren, B. M., Adams, D. M., Mayer, R. E., & Forlizzi, J. (2017). A computer-based game that promotes mathematics learning more than a conventional approach. *International Journal of Game-Based Learning (IJGBL)*, 7(1), 36-56. doi:10.4018/IJGBL.2017010103
- McLaren, B.M., van Gog, T., Ganoë, C., Karabinos, M., & Yaron, D. (2016). The efficiency of worked examples compared to erroneous examples, tutored problem solving, and problem solving in classroom experiments. *Computers in Human Behavior*, 55, 87-99.

- Shareghi Najar, A., Mitrovic, A., & McLaren, B.M. (2016). Learning with intelligent tutors and worked examples: Selecting learning activities adaptively leads to better learning outcomes than a fixed curriculum. *User Modeling and User-Adapted Interaction: The Journal of Personalization Research (UMUAI)*, 26(5), 459–491. doi:10.1007/s11257-016-9181-y
- Aleven, V., Roll, I., McLaren, B. M., & Koedinger, K. R. (2016). Help helps, but only so much: Research on help seeking with intelligent tutoring systems. *International Journal of Artificial Intelligence in Education*, 26(1), 205-223. doi: 10.1007/s40593-015-0089-1
- Aleven, V., McLaren, B. M., Sewall, J., van Velsen, M., Popescu, O., Demi, S., Ringenber, M. & Koedinger, K. R. (2016). Example-tracing tutors: Intelligent tutor development for non-programmers. *International Journal of Artificial Intelligence in Education*, 26(1), 224-269. doi: 10.1007/s40593-015-0088-2
- McLaren, B. M., Adams, D. M., & Mayer, R.E. (2015). Delayed learning effects with erroneous examples: A study of learning decimals with a web-based tutor. *International Journal of Artificial Intelligence in Education*, 25(4), 520-542.
- Adams, D., McLaren, B. M., Durkin, K., Mayer, R.E., Rittle-Johnson, B., Isotani, S., & Van Velsen, M. (2014). Using erroneous examples to improve mathematics learning with a web-based tutoring system. *Computers in Human Behavior*, 36C (2014), 401-411. Elsevier. doi: 10.1016/j.chb.2014.03.053.
- Scheuer, O., McLaren, B. M., Weinberger, A., & Niebuhr, S. (2014). Promoting critical, elaborative discussions through a collaboration script and argument diagrams. *Instructional Science*, 42(2), 127–157. doi:10.1007/s11251-013-9274-5.
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Book Chapters

- Loll, F., Pinkwart, N., Scheuer, O., & McLaren, B.M. (2012). “How Tough Should It Be? Simplifying the Development of Argumentation Systems using a Configurable Platform.” In N. Pinkwart, & B. M. McLaren (Eds.), *Educational Technologies for Teaching Argumentation Skills*, Bentham Science Publishers.
- Scheuer, O., McLaren, B.M., Loll, F., & N. Pinkwart (2012). “Automated Analysis and Feedback Techniques to Support and Teach Argumentation: A Survey.” In N. Pinkwart & B.M. McLaren (Eds.) *Educational Technologies for Teaching Argumentation Skills*, Bentham Science Publishers.

- Scheuer, O. & McLaren, B.M. (2012). "Educational Data Mining." In: N. M. Seel (Ed.), *Encyclopedia of the Sciences of Learning*, (pp. 1075-1079). Springer, New York.
- McLaren, B.M. (2011). "Computational Models of Ethical Reasoning: Challenges, Initial Steps, and Future Directions." In M. Anderson & S.L. Anderson (Eds.), *Machine Ethics*. Chapter 17, 297-315, Cambridge University Press.
- Tchounikine, P., Rummel, N. & McLaren, B.M. (2010). "Computer Supported Collaborative Learning and Intelligent Tutoring Systems." In R. Nkambo, J.Bourdeau, & R. Mizoguchi (Eds.) *Advances in Intelligent Tutoring Systems*. Chapter 22, 447-463, Springer.
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Peer-Reviewed Conference, Workshop, and Symposium Papers (Past 5 years, 2014-2018)

- Holstein, K., McLaren, B.M. & Aleven, V. (2018). Student learning benefits of a mixed-reality teacher awareness tool in AI-enhanced classrooms. In C. Rosé, R. Martínez-Maldonado, H.U. Hoppe, R. Luckin, M. Mavrikis, K. Porayska-Pomsta, B. McLaren and B. du Boulay (Eds.). *Proceedings of the 19th International Conference on Artificial Intelligence in Education (AIED 2018)*. LNAI 10947 (pp. 154-168). Springer: Berlin. **Won the Best Paper Award (in a tie with one other paper)**
- Nguyen, H., Harpstead, E., Wang, Y. & McLaren, B.M. (2018). Student agency and game-based learning: A study comparing low and high agency. In C. Rosé, R. Martínez-Maldonado, H.U. Hoppe, R. Luckin, M. Mavrikis, K. Porayska-Pomsta, B. McLaren and B. du Boulay (Eds.). *Proceedings of the 19th International Conference on Artificial Intelligence in Education (AIED 2018)*. LNAI 10947 (pp. 338-351). Springer: Berlin
- Holstein, K., Yu, Z., Sewall, J., Popescu, O., McLaren, B.M. & Aleven, V. (2018). Opening up an intelligent tutoring system development environment for extensible student modeling. In C. Rosé, R. Martínez-Maldonado, H.U. Hoppe, R. Luckin, M. Mavrikis, K. Porayska-Pomsta, B. McLaren and B. du Boulay (Eds.). *Proceedings of the 19th International Conference on Artificial Intelligence in Education (AIED 2018)*. LNAI 10947 (pp. 169-183). Springer: Berlin.
- Albacete, P., Jordan, P., Lusetich, D., Chounta, I-A., Katz, S. & McLaren, B.M. (2018). Providing proactive scaffolding during tutorial dialogue using guidance from student model predictions. In C. Rosé, R. Martínez-Maldonado, H.U. Hoppe, R. Luckin, M. Mavrikis, K. Porayska-Pomsta, B. McLaren and B. du Boulay (Eds.). *Proceedings of the 19th International Conference on Artificial Intelligence in Education (AIED 2018)*. LNAI 10947 (Part II, pp. 20-25). Springer: Berlin.
- Holstein, K., McLaren, B.M. & Aleven, V. (2018). Informing the design of teacher awareness tools through causal alignment analysis. In J. Kay and R. Luckin (Eds.). *Proceedings of the 13th International Conference of the Learning Sciences (ICLS'18)*. (pp. 104-111). **Won the Best Student Paper Award**
- Holstein, K., Hong, G., Tegene, M., McLaren, B. M., Aleven, V. (2018). The classroom as a dashboard: Co-designing wearable cognitive augmentation for K-12 teachers. In the *Proceedings of the 8th International Learning Analytics & Knowledge Conference (LAK'18)*. (pp. 79-88). ACM.
- van Leeuwen, A., Rummel, N., Holstein, K., McLaren, B. M., Aleven, V., Molenaar, I., Campen, C. K., Schwarz, B., Prusak, N., Swidan, O., Segal, A., & Gal, K. (2018). Orchestration tools for teachers in the context of individual and collaborative learning: What information do teachers need and what do they do with it? In J. Kay and R. Luckin (Eds.). *Proceedings of the 13th International Conference of the Learning Sciences (ICLS'18)*. (pp. 104-111).
- Katz, S., Albacete, P., Jordan, P., Lusetich, D., Chounta, I-A., & McLaren, B.M. (2018). What does it mean to provide the right level of support during tutorial dialogue? In the *Proceedings of the 14th International Conference on Intelligent Tutoring Systems (ITS 2018)*.

- Eagle, M., Corbett, A., Stamper, J., & McLaren, B.M. (2018). Predicting Individualized Learner Models Across Tutor Lessons. In the *Proceedings of the 11th International Conference on Educational Data Mining (EDM 2018)*.
- McLaren, B. M., Asbell-Clarke, J. & Hammer, J. (2018). “CHI 2018 Workshop: Data-Driven Educational Game Design” CHI 2018 Workshop at the CHI conference in Montreal, Quebec Canada.
- McLaren, B.M., Farzan, R., Eagle, M., Adams, D.M., Mayer, R.E., & Forlizzi, J. (2017). Uncovering gender and problem difficulty effects in learning with an educational game. In the *Proceedings of the 18th International Conference on Artificial Intelligence in Education (AIED 2017)*. **Won the Best Poster Paper Award (One of three winners out of 38 total posters)**
- Eagle, M., Corbett, A., Stamper, J., McLaren, B.M., Baker, R., Wagner, A., MacLaren, B., & Mitchell, A. (2017). Exploring learner model differences between students. In the *Proceedings of the 18th International Conference on Artificial Intelligence in Education (AIED 2017)*.
- Xhakaj, F., Alevan, V. & McLaren, B.M. (2017). Effects of a dashboard for an intelligent tutoring system on teacher knowledge, lesson plans and class sessions. In the *Proceedings of the 18th International Conference on Artificial Intelligence in Education (AIED 2017)*.
- Chounta, I-A., McLaren, B.M., Albacete, P., Jordan, P., & Katz, S. (2017). The grey area: Towards a computational approach for modeling the zone of proximal development. In the *Proceedings of the 10th International Conference on Educational Data Mining (EDM 2017)*.
- Holstein, K., McLaren, B.M., & Alevan, V. (2017). Intelligent tutors as teachers' aides: Exploring teacher needs for real-time analytics in blended classrooms. In the *Proceedings of the Seventh International Learning Analytics & Knowledge Conference (LAK-2017)*. (pp. 257-266). ACM.
- Holstein, K., McLaren, B.M., & Alevan, V. (2017). SPACLE: Investigating learning across virtual and physical spaces using spatial replays. In the *Proceedings of the Seventh International Learning Analytics & Knowledge Conference (LAK-2017)*. (pp. 358-367). ACM.
- Chounta, I-A., McLaren, B.M., & Harrell, M. (2017). Building arguments together or alone? Using learning analytics to study the collaborative construction of argument diagrams. In the *Proceedings of the 12th International Conference on Computer Supported Collaborative Learning (CSCL 2017)*.
- Xhakaj, F., Alevan, V. & McLaren, B.M. (2017). Effects of a dashboard for an intelligent tutoring system on teacher knowledge, lesson planning, lessons, and student learning. In the *Proceedings of the 12th European Conference on Technology Enhanced Learning (EC-TEL 2017)*.
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- Eagle, M., Corbett, A., Stamper, J., McLaren, B. M., Baker, R., Wagner, A., MacLaren, B., & Mitchell, A. (2016). Predicting individual differences for learner modeling in intelligent tutors from previous learner activities. In F. Cena, M. Desmarais, D. Dicheva, J. Zhang (Eds.), *Proceedings of the 24th Conference on User Modeling, Adaptation and Personalization (UMAP 2016)*. ACM, New York, NY. (pp. 55-63) ISBN 978-1-4503-4370-1/16/07. DOI: <http://dx.doi.org/10.1145/2930238.2930255> **Won the Best Paper Award**
- Eagle, M., Corbett, A., Stamper, J., McLaren, B. M., Wagner, A., MacLaren, B., & Mitchell, A. (2016). Estimating individual differences for student modeling in intelligent tutors from reading and pretest data. In A. Micarelli, J. Stamper, & K. Panourgia (Eds.), *Proceedings of the 13th International Conference on Intelligent Tutoring Systems (ITS 2016)*. LNCS 9684 (pp. 133-143). **Nominated for the Best Paper Award**
- Xhakaj, F., Alevan, V. & McLaren, B. M (2016). How teachers use data to help students learn: Contextual inquiry for the design of a dashboard. In K. Verbert et al. (Eds.), *Proceedings of the Eleventh European Conference on Technology Enhanced Learning (EC-TEL 2016)*. LNCS 9891 (pp. 340-354). DOI: 10.1007/978-3-319-45153-4_26

- Chounta, I-A., McLaren, B. M., Albacete, P., Jordan, P., & Katz, S., (2016). Analysis of Human-to-Human Tutorial Dialogues: Insights for Teaching Analytics. In the *Proceedings of the Fourth International Workshop on Teaching Analytics (IWTA 2016)* at The Eleventh European Conference on Technology Enhanced Learning (*EC-TEL 2016*). Lyon, France, September 13-16, 2016.
- Chounta, I-A., McLaren, B. M. & Harrell, M. (2016). Let's argue over it: Are argumentation skills better learned collaboratively or individually? In the *Proceedings of the Workshop on Connecting Learning Analytics and Learning Design (CLAD 2016)* at The Eleventh European Conference on Technology Enhanced Learning (*EC-TEL 2016*). Lyon, France, September 13-16, 2016.
- Holstein, K., Xhakaj, F., Aleven, V. & McLaren, B. M. (2016). Luna: A dashboard for teachers using intelligent tutoring systems. In the *Proceedings of the Fourth International Workshop on Teaching Analytics (IWTA 2016)* at the Eleventh European Conference on Technology Enhanced Learning (*EC-TEL 2016*). Lyon, France, September 13-16, 2016.
- Aleven, V., Xhakaj, F., Holstein, K., & McLaren, B. M. (2016). Developing a teacher dashboard for use with intelligent tutoring systems. In the *Proceedings of the Fourth International Workshop on Teaching Analytics (IWTA 2016)* at the Eleventh European Conference on Technology Enhanced Learning (*EC-TEL 2016*). Lyon, France, September 13-16, 2016.
- McLaren, B. M., van Gog, T., Ganoë, C., Yaron, D., & Karabinos, M. (2015). Worked Examples are more efficient for learning than high-assistance instructional software. In C. Conati, N. Heffernan, A. Mitrovic, & M. F. Verdejo (Eds.), *Proceedings of the 17th International Conference on Artificial Intelligence in Education (AIED 2015)*. LNAI 9112 (pp. 710-713). **Won the Best Poster Paper Award (Out of 78 posters)**
- Shareghi Najar, A., Mitrovic, A., & McLaren, B.M. (2015). Examples and tutored problems: Adaptive support using assistance scores. *Proceedings of the 24th International Joint Conference on Artificial Intelligence (IJCAI 2015)*, Buenos Aires, July 25-31 2015, pp. 4317-4323.
- McLaren, B.M., Timms, T., Weihnacht, D., Brenner, D., Luttgen, K., Grillo-Hill, A., & Brown, D.H. (2014) A web-based system to support inquiry learning: Towards determining how much assistance students need. In Zvacek, S., Restivo, M.T., Uhomobhi, J. and Helfert, M. (Eds.) *Proceedings of the Sixth International Conference on Computer-Supported Education (CSEDU-2014)*. Volume 1 (pp. 43-52). SCITEPRESS – Science and Technology Publications.
- McLaren, B.M., van Gog, T., Ganoë, C., Yaron, D. & Karabinos, M. (2014) Exploring the assistance dilemma: Comparing instructional support in examples and problems. In S. Trausan-Matu et al. (Eds.) *Proceedings of the Twelfth International Conference on Intelligent Tutoring Systems (ITS-2014)*. LNCS 8474. (pp. 354-361). Springer International Publishing Switzerland.
- Shareghi, N. A., Mitrovic, A. and McLaren, B.M. (2014) Adaptive support versus alternating worked examples and tutored problems: Which leads to better learning? Aalborg, Denmark: In the *Proceedings of the 22nd Conf. User Modelling, Adaptation and Personalization (UMAP 2014)*. LNCS 8538 (pp. 171-182). <http://www.um.org/umap2014/>. **Won Best Student Paper Award**
- Forlizzi, J., McLaren, B.M., Ganoë, C., McLaren, P.B., Kihumba, G., & Lister, K. (2014) Decimal Point: Designing and developing an educational game to teach decimals to middle school students. To be presented at the *8th European Conference on Games Based Learning*. October 9-10, 2014, Berlin, Germany.
- Scheuer, O., McLaren, B. M., & Weinberger, A. (2013). Supporting Discussions through Argument Diagrams and Collaboration Scripts. Paper presented at the symposium "Computer-Supported Collaborative Learning (CSCL): Exploring Synergetic Scaffolding and Scripting" at the *15th Biennial EARLI Conference for Research on Learning and Instruction (EARLI 2013)*.
- Adams, D., McLaren, B.M., Mayer, R.E., Gogvadze, G., & Isotani, S. (2013). Erroneous examples as desirable difficulty. In Lane, H.C., Yacef, K., Mostow, J., & Pavlik, P. (Eds.). *Proceedings of the 16th International Conference on Artificial Intelligence in Education (AIED 2013)*. 7926 (pp. 803-806). Springer, Berlin.

- Mavrikis, M., Dragon, T., Yiannoutsou, N. & McLaren, B. M. (2013). Towards Supporting ‘Learning to Learn Together’ in the Metafora platform. In the *Proceedings of the Intelligent Support for Learning in Groups Workshop* held at the 16th *International Conference on Artificial Intelligence in Education (AIED 2013)*.
- Yang, Y., Wegerif, R., Dragon, T., Mavrikis, M., & McLaren, B. M. (2013). Learning how to learn together (L2L2): Developing tools to support an essential complex competence for the Internet Age. In Rummel, N., Kapur, M., Nathan, M. & Puntambekar S. (Eds.), *Conference Proceedings Volume II of the 10th International Conference on Computer Supported Collaborative Learning (CSCL 2013)*. (pp. 193-196). International Society of the Learning Sciences.
- Tsovaltzi, D., Weinberger, A., Scheuer, O., Dragon, T., & McLaren, B. M. (2013). Collaborative learning in Facebook: Can argument structure facilitate academic opinion change? In Rummel, N., Kapur, M., Nathan, M. & Puntambekar S. (Eds.), *Conference Proceedings Volume II of the 10th International Conference on Computer Supported Collaborative Learning (CSCL 2013)* (pp. 177-180). International Society of the Learning Sciences.
- Scheuer, O., McLaren, B. M., & Weinberger, A. (2013). Automated and adaptive support for educational discussions: Results to guide in making this a reality. In Rummel, N., Kapur, M., Nathan, M. & Puntambekar S. (Eds.), *Conference Proceedings Volume II of the 10th International Conference on Computer Supported Collaborative Learning (CSCL 2013)* (pp. 349-350). International Society of the Learning Sciences.

***** 88 additional papers published between 1988 and 2013

PERSONAL ACHIEVEMENTS

- Hiked the entire Appalachian Trail, Georgia to Maine, over 2,000 miles in length, in 1989.