

# Alexander Repenning

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Dr. Alexander Repenning is a Professor and Chair of Computer Science Education, Pädagogische Hochschule FHNW, Switzerland. He is directing the international Scalable Game Design Initiative. He has offered game design workshops in the USA, Europe and Japan. Repenning is a pioneer in drag and drop blocks-based programming and the creator of AgentSheets/AgentCubes. His work has received numerous awards and has been featured in WIRED Magazine. Repenning has served as advisor to the National Academy of Sciences, the European Commission, The Japanese Ministry of Education, the Organization for Economic Co-operation and Development (OECD), the White House Office of Science and Technology Policy (OSTP) and the National Science Foundation. In Switzerland, Repenning was selected to be one of the 100 Digital Shapers.

## Education

1993	Ph.D., Computer Science	Computer Science, University of Colorado at Boulder
1993	Cognitive Science Certificate	Institute of Cognitive Science, University of Colorado
1990	M.S., Computer Science	Computer Science, University of Colorado at Boulder
1985	B.S., Computer Engineering	Engineering College Brugg-Windisch, Switzerland

## Appointments

Spring 2015 -	<b>Member of the Center for Educational Sciences University of Basel</b>
Spring 2019 - present	<b>Professor and Chair of Computer Science Education, Pädagogische Hochschule FHNW, Switzerland.</b>
Spring 2014 - 2019	<b>Hasler Professor and Chair of Computer Science Education, Pädagogische Hochschule FHNW, Switzerland.</b>
Spring 2014 - present	<b>Fellow of the Center for STEM Learning (CSL), University of Colorado</b>
Fall 2019 - present	<b>University of Colorado, Computer Science Department: Adjunct Full Research Professor</b>
Fall 2011 - 2019	<b>University of Colorado, Computer Science Department: Full Research Professor</b>
Oct. 2006- 2007	<b>University of Lugano, Computer Science Department: Associate Professor</b> Visiting Professor.
March 2004 -	<b>University of Colorado, Computer Science Department: Associate Research Professor</b>
March 1996 - March 2004	<b>University of Colorado, Computer Science Department: Assistant Research Professor, Institute of Cognitive Science: Faculty Fellow</b>

*Research:* Explore new end-user programming paradigms enabling a wide range of users to comprehend and communicate complex ideas through interactive simulations. Build advanced compiler technology to automatically turn end-user programmed interactive simulations into Java applets and JavaBeans components. Devise new component-based software engineering

approaches enabling distributed teams of developers, content experts, producers and users to effectively build educational software. Develop a new framework called The Pragmatic Web to enable information challenged Web users to access and interact with information through multimodal, speech enabled, end-user programmable agents.

*Teaching:* Teach user interface design, object-oriented design, visual programming language issues and compiler design in project-based course. Teach agent-centered AI course through game design projects. Engage students in component-based design and programming making students build interactive middle school math applications published on the MathForum and on the Public Broadcast System (PBS).

Nov. 2002 –  
present  
Feb. 1998 -  
Nov. 2002

**CTO of AgentSheets Inc. , part-time.**

**President and Interim CEO of AgentSheets Inc.**

Founded AgentSheets Inc. with the goal to create sustainable simulation authoring tools and services for lifelong learning. Research Web-based reuse of agents, projects and course material to lower threshold for teachers to use simulation technology in curriculum (NSF supported). Start collaboration with organizations in Germany (Fraunhofer Institute) and Japan (PFU limited) to use AgentSheets in international projects.

Jan. 1994 –  
Feb. 1996

**University of Colorado at Boulder: Research Associate**

Taught graduate/undergraduate courses on learning and design. Organized Computer Science Summer Intern Camp 1994 and 1995. Collaborated with the MIT Media Lab by supervising senior project students at CU creating the LEGOsheets environment used to visually program the programmable LEGO brick developed by MIT. Worked with Apple towards turning Agentsheets into a commercial educational application. Supervised research creating interactive World Wide Web applications. Worked with Boulder teachers and students.

June 1992 –  
Aug. 1992

**Hewlett-Packard, Switzerland: User Interface Designer**

Evaluated user interface of HP expert system shell. Performed user studies with users, designers and project leaders. Created user test suite for future product usability evaluations.

June 1991 –  
Aug. 1991

**Xerox PARC: Intern**

Built a content-based hypertext system called BUCH for SPARC stations to gracefully retrieve textual information in extremely large, complex, and ill-structured information spaces. Produced and published video of BUCH.

Nov. 1985 –  
June 1988

**Asea Brown Boveri Research Center, AI Group, Switzerland: Researcher**

Designed and implemented the OPUS object-oriented programming language including programming environment, user interface builder, and widget library. Built portable graphical user interface for Windows, DOS, Macintosh, and VAX. Developed knowledge representation, rule-based programming language and spreadsheet-like user interface for expert system shell. Developed an Object-Oriented Prolog interpreter. Responsible for internships.

Aug 1977- May  
1982

**Asea Brown Boveri: Electronics Designer**

Designed and produced analog and digital equipment, computer chips and electromechanical devices including: FM transmitters, high energy power supplies, gas and steam turbine power plant controllers, stereo HIFI amplifiers, disk controllers, programmable PROM burners, high performance A/D+D/A boards, and personal computers. Produced small series of personal computers.

## Awards & Recognition

- 2021 **World Leader in Computational Thinking.** A Scientometric Study of Computational Thinking analyzing 1,874 publications from 3,779 authors determined Repenning to be [the #1 contributor to Computational Thinking research worldwide](#) in the last 15 years. On the same list, in the top 15, are two of Repenning's Ph.D. students: Kyuhan Koh and Ashok Basawapatna.
- 2020 **Most Influential Paper last 10 years.** The 2010 "Towards the Automatic Recognition of Computational Thinking for Adaptive Visual Language Learning" paper presented at Visual Languages / Human Centric Computing (VL/HCC) was awarded the "Most Influential Paper Award" in the last 10 years.
- 2016 **Working meeting with President of Switzerland** (Johann Schneider-Amman) and selection to be one of the 100 „Digital Shapers" in Switzerland.
- 2016 **White House Office of Science and Technology Policy (OSTP)**, invited to present research at panel and to conduct workshop regarding digital learning with games at next generation STEM high school event.
- 2015 **National Science Foundation**, invited to present work at **Next Generation STEM Learning for All**, recognized for high potential to contribute to National discourse about and provide a strong example of innovation that could inform the future of STEM learning and education.
- 2015 **Boulder Faculty Assembly, University of Colorado Recognition** for outstanding outreach.
- 2014 **Invitation to become a Fellow of the Center for STEM Learning (CSL)** to recognize outstanding contributions to teaching and learning on the University of Colorado, Boulder campus.
- 2013 **Research Covered in WIRED Magazine.** October Issue.
- 2013 **University of Colorado Computer Science for High School (CS4HS) Project featured by Google.** The Google CS4HS Program showcased the University of Colorado CS4HS project broadcasting a live interview with students, teacher, researchers and administrators.
- 2013 **Scalable Game Design project showcased by the National Science Foundation.** NSF has invited Repenning to showcase the Scalable Game Design project at the 44rd ACM Technical Symposium on Computer Science Education (SIGCSE 2013): Teaching, Learning, and Collaborating conference.
- 2012 **Scalable Game Design project showcased by the National Science Foundation.** NSF has invited Repenning to showcase the Scalable Game Design project at the 43rd ACM Technical Symposium on Computer Science Education (SIGCSE 2012): Teaching, Learning, and Collaborating conference, and the CE21 Computing Education for the 21st Century PI and Community Meeting.
- 2011 **NSF success story for Congressional Publication.** Two of Repenning's NSF research projects, AgentSheets and Inflatable Icons, related to educational technology were nominated as NSF success stories from the Directorate of Engineering to be included in Congressional Publications. AgentSheets was presented as one of only 3 projects to the director of the National Science Foundation as a success story how NSF support has helped build an infrastructure for formal and informal learning for K-20 students through the development of play environments that promote STEM, especially computational thinking and engineering design, learning in formal and informal environments.
- 2010 **Telluride Tech Festival Honoree.** Repenning was honored at the 2010 Telluride Tech Festival for contributions to computer science. Past honorees include Sir Tim Berners-Lee (creator of the World Wide Web), Vinton Cerf (father of the Internet), and Alan Kay (Turing Award recipient and inventor of modern object-oriented programming).
- 2010 **Congressional Hearing.** Repenning's Collective Simulation, the Mr. Vetro human physiology education research, was included in the Congressional Justification for 2011 budget for the National Institutes of Health (NIH) presented by the National Center for Research Resources (NCRR).

- 2009 **Entrepreneurship Recognition, University of Colorado, Technology Transfer Office and the Boulder Innovation Center.** Recognition by CU Interim Provost and Executive Vice Chancellor for Academic Affairs Dr. Stein Sture.
- 2008 **Electronic Arts Scholar.** Recognition for game related research attracting women and under-represented populations to study Computer Science. Sponsored participation of Electronic Arts, ACM, and Microsoft Research supported GDCSE'08 conference aboard the Celebrity Century Cruise Ship.
- 2007 **University of Colorado Science Discovery Development Board member.** Board includes Nobel Laureates, Deans and Department chairs.
- 2005 **Advisor to the Organization for Economic Co-operation and Development (OECD):** presented a simulation framework for the Programme for the International Assessment for Adult Competencies (PIAAC), Sept 12-13, German Institute for Adult Education, Bonn, Germany.
- 2002 **Advisor to the International Media Research Foundation,** an organization sponsored by the Japanese Ministry of Education and the Ministry of International Trade and Industry, June 27 - July 4, Workshop, presentation and exhibit, Tokyo, Japan.
- 2001, 2002 **Advisor to the European Commission:** launching a new End-User Development research initiative. Presentation of AgentSheets at the IST conference, Düsseldorf, Germany 2001, EUD Network of Excellence, Pisa, Italy, 2002.
- 2001 **Invited by Japanese Government** to World Expo 2001, Asia #1 Information Technology trade show. Tokyo.
- 2001 **Advisor to National Academy of Sciences** at “Improving Learning through Information Technology” symposium. Showcase AgentSheets as exemplary technology. Washington.
- 2001 **Best of the Best Innovators:** Invited, sponsored exhibition of research by Association for Computing Machinery at ACM 1, San Jose.
- 1996 **Most Innovative Application of the World Wide Web.** WebQuest, an AgentSheets based application, is awarded Gold medal by Isabelle de Kerviler, Mayor of Paris. WebQuest paper is awarded best paper of WWW5 by Robert Cailliau, CERN. Paris.
- 1993 **Recognition of Outstanding Contributions,** Apple Computer Inc., Repenning, introduced by Apple’s VP presented AgentSheets in front of thousands of developers at Apple’s World Wide Developer Conference ATG Extravaganza. San Jose.
- 1988 **Brown Boveri Research Center Scholarship** (\$20,000, 2 years)
- 1985 **Contraves Award** (best thesis of Engineering College Brugg-Windisch)

## Grants

**Repenning has been the principal investigator on 26 grants (mostly NSF, some NIH and some private foundations, e.g., Google). He has raised a total of about \$20M.**

Hasler Foundation Switzerland, Endowment for first Computer Science Education Professorship in Switzerland, \$2,000,000. School of Education, University of Applied Sciences and Arts, Northwestern Switzerland. 2014-2018.

National Science Foundation, Innovative Technology Experiences for Students and Teachers (ITEST Scaleup), \$1,920,020.00, oDREAMS: Promoting Computational Thinking through Game & Simulation Design, Alexander Repenning (Principal Investigator), Kris Gutierrez (Co- Principal Investigator), David Webb (Co- Principal Investigator), August 1, 2013 - July 31, 2018.

Google Inc., CS4HS, Computer Science for High Schools, \$35,000, Seeding Computer Science Principles in Middle Schools, Alexander Repenning (Principal Investigator), 2015.

Google RISE Partnership, Chic@s Code, Scalable Game Design Mexico: Computer Science Education for Latinas in Mexico and the USA, \$100,000. 2015-2016.

National Science Foundation, Small Business Innovation Research Program, IIP-1345523, \$150,000, SBIR Phase I: REACT: Fostering Computational Thinking through Real-time Classroom Learning Assessment, January 1, 2014 - June 30, 2014.

Google Inc., CS4HS, Computer Science for High Schools, \$10,000, Use of AgentSheets as Computational Thinking Tools, Alexander Repenning (Principal Investigator), 2014.

Google Inc., Google RISE Award, Scalable Game Design NATIVE, \$25,000, Computer Science Education through Scalable Game Design for Native American Tribes, Alexander Repenning (Principal Investigator), Ian Her Many Horses (Co-Principal Investigator), Yasko Endo (Co-Principal Investigator), 2014.

National Institutes of Health (NIH), Office of Research Infrastructure Programs, SBIR Phase I, R43 OD012081, CyberMOD: A Gentle-Slope Cyberlearning Infrastructure to Support STEM Education, \$150,000, Sept. 1, 2012- Feb. 2013, Alexander Repenning (Principal Investigator).

Google Inc., CS4HS, Computer Science for High Schools, \$15,000, Scaling Up the Auroa Public Schools District, Alexander Repenning (Principal Investigator), 2013.

Google Inc., CS4HS, Computer Science for High Schools, \$10,000, Use of AgentSheets as Computational Thinking Tools, Alexander Repenning (Principal Investigator), 2012.

National Science Foundation, Computing Education for 21st Century (CE 21), Type II: CT4TC - Computational Thinking for Teaching Computing: Validating a Theory of Broadening Participation, \$1,500,000, Alexander Repenning (Principal Investigator), Kris Gutierrez (Co- Principal Investigator), David Webb (Co- Principal Investigator), Jan 1, 2012 – Dec. 31, 2014. *Original proposal (\$7M) was recommended for funding but the CE21 program got defunded. This is still the largest CE21 Type I/Type II project and the only CE21 Type II proposal funded by NSF.*

National Science Foundation, SBIR, 1158792, SBIR Phase IIB: Scalable Game Design: Broadening Computer Science Participation with Low-Threshold, High-Ceiling Design Environments, \$54,375, Alexander Repenning (Principal Investigator).

National Science Foundation, Technology Enhancement for Commercial Partnerships, SBIR Phase II TECP: Scalable Game Design: Broadening Computer Science Participation with Low-Threshold, High-Ceiling Design Environments, \$93,028.00, A collaboration between AgentSheets and Google Inc. to bring 3D Inflatable Icons to the Web and integrate it to Google Sketchup, Alexander Repenning (Principal Investigator). March 1, 2011 – August 31, 2011.

National Science Foundation, Innovative Technology Experiences for Students and Teachers (ITEST), Reforming IT Education through Game Design: Integrating Technology-Hub, Inner City, Rural and Remote Regions, \$1,499,425, Alexander Repenning (Principal Investigator), Jeffery Kidder (Co- Principal Investigator), David Webb (Co- Principal Investigator ), Jan 1, 2009 – Dec. 31, 2011.

National Science Foundation, SBIR & REESE, REU, Research Experience for Undergraduates, \$16,000, 3D Game and Simulation Web players, Alexander Repenning (Principal Investigator), July 1 – December 31, 2010.

National Science Foundation, Division of Industrial Innovation and Partnerships, SBIR Phase I: CyberCollage: A Collective Programming Environment for the Social Exploration of Computational Thinking through Games, \$149,950, Alexander Repenning (Principal Investigator), July 1 – December 31, 2010.

Google Inc., CS4HS, Computer Science for High Schools, \$20,000, Use of AgentSheets as Computational Thinking Tools, Clayton Lewis (Principal Investigator), Alexander Repenning (CO-PI), Anthea Rooen (CO-PI), 2010.



National Science Foundation and ARPA, Technical Reinvestment Program, "Authoring tools for Tomorrow", February 15, 1993 – August 31, 1994, \$220,000.00, James Spohrer (Principal Investigator), Gerhard Fischer (Co-Principal Investigator), Alexander Repenning (Co-Principal Investigator).

National Science Foundation, Undergraduate Research REU Supplement, "Learning by Design", 1997-1998, \$20,000.00, Gerhard Fischer (Principal Investigator), Alexander Repenning (Co-Principal Investigator), Hal Eden (Co-Principal Investigator), Michael A. Eisenberg (Co-Principal Investigator).

University of Colorado, Engineering Excellence Fund, "Simulations for K-12 Outreach", Spring 1996, \$6028.16, Alexander Repenning (Principal Investigator).

National Science Foundation, REC, "Mastering High-Functionality Systems by Supporting Learning on Demand", September 1, 1992 - February 28, 1995, \$1,167,168.00, Gerhard Fischer (Principal Investigator), Michael A. Eisenberg (Co-Principal Investigator), Alexander Repenning (Co-Director).

## Publications

### Refereed Conference Proceedings

N. Fahrni, and A. Repenning, "Quantifying the Corona Effect: Does online Inspiration trump face2face Collaboration?" presented at the 17th Workshop in Primary and Secondary Computing Education (WiPSCE 2022), Morschach, Switzerland, 2022

Repenning, A., A. Lamprou, and A. Basawapatna, "Computing Effect Sizes of a Science-first-then-didactics Computational Thinking Module for Preservice Elementary School Teachers," presented at the Special Interest Group on Computer Science Education Technical Symposium (SIGCSE TS 2021), Toronto, Canada, 2021, 7.

Repenning, A. and A. Basawapatna, "Smacking Screws with Hammers: Experiencing Affordances of Block-based Programming through the Hourglass Challenge," presented at the Special Interest Group on Computer Science Education Technical Symposium (SIGCSE TS 2021), Toronto, Canada, 2021, 7.

Repenning, A., J. Zurmühle, A. Lamprou, and D. Hug, "Computational Music Thinking Patterns: Connecting Music Education with Computer Science Education through the Design of Interactive Notations," presented at the 12th International Conference on Computer Supported Education, Prag, 2020, 641-652.

Repenning, A., A. Lamprou, S. Petralito, and A. Basawapatna, "Mandatory pre-service teacher Computer Science Education: Exploring a demographic shift in Switzerland.," in Innovation and Technology in computer Science Education, (ITiCSE'19), Aberdeen, Scotland, UK, 2019.

A. Basawapatna, A. Repenning, and M. Savignano, "Zones of Proximal Flow Tutorials: Designing Computational Thinking Cliffhangers," presented at the The 50th ACM Technical Symposium on Computer Science Education (SIGCSE 2019), Minneapolis, Minnesota, USA, 2019.

A. Lamprou and A. Repenning, "Teaching how to teach Computational Thinking," presented at the the 23rd Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE 2018), Larnaca, Cyprus, 2018.

A. Basawapatna, A. Repenning, M. Savignano, J. Manera, N. Escherle, and L. Repenning, "Is Drawing Video Game Characters in an Hour of Code Activity a Waste of Time?," presented at the the 23rd Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE 2018), Larnaca, Cyprus, 2018.

Hug, D., Petralito, S., Hauser, S., Lamprou, A., Repenning, A., Bertschinger, D., Stüber, N., Cslovjecsek, M.: Exploring Computational Music Thinking in a Workshop Setting with Primary and Secondary School Children, In: Proceedings of Audio Mostly 2017 - 12th Conference on Interaction with Sound, London, UK, 2017 (nominated for best paper). *Acceptance Rate 29%*

C. Brand and A. Repenning, "Helping Teachers and Students learn to use 3D in Agentcubes online," presented at the 2017 IEEE Blocks and Beyond Workshop (B B 2), Raleigh, NC, USA, 2017, 103-104.

- A. Lamprou, A. Repenning, and N. A. Escherle, "[The Solothurn Project — Bringing Computer Science Education to Primary Schools in Switzerland.](#)" presented at the 22nd Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE 2017), Bologna, Italy, 2017.
- A. Basawapatna and A. Repenning, "[Employing Retention of Flow to Improve Online Tutorials.](#)" Special Interest Group of Computer Science Education (SIGCSE 2017), Seattle, Washington, USA, 2017. *nominated for Best Paper award: selected as Exemplary Computer Science Education Research paper (30% acceptance rate)*
- A. Repenning, A. Basawapatna, and N. Escherle, "Computational Thinking Tools," presented at the IEEE Symposium on Visual Languages and Human-Centric Computing, Cambridge, UK, 2016.
- A. Repenning and A. Basawapatna, "Drops and Kinks: Modeling the Retention of Flow for Hour of Code Style Tutorials," to be presented at the 11th Workshop in Primary and Secondary Computing Education (WiPSCE 2016), Münster, Germany, 2016.
- Hug, D., Stüber, N., Repenning, A., Cslovjecssek, M., Hauser, S., Agotai, D., Miyazaki, S., Escherle, N., Assaf, D.: Computational Music Thinking - Using End-User Programming to Explore Musical Creation in an STEAM-oriented Integrated Music Education Setting. In: Proceedings of ISME 2016, Glasgow, UK, 2016.
- Repenning, A., Basawapatna, A., Assaf, D., Maiello, C., & Escherle, N. (2016). Retention of Flow: Evaluating a Computer Science Education Week Activity. The Special Interest Group of Computer Science Education (SIGCSE 2016), Memphis, Tennessee.
- Escherle, N., Ramirez-Ramirez, S., Basawapatna, A., Assaf, D., Repenning, A., Maiello, C., Nolzco-Florez, J. (2016). Piloting Computer Science Education Week in Mexico. The Special Interest Group of Computer Science Education (SIGCSE 2016), Memphis, Tennessee.
- B. Worrell, C. Brand, and A. Repenning, "Collaboration and Computational Thinking: A Classroom Structure," presented at the IEEE Symposium on Visual Languages and Human-Centric Computing, (VL/HCC 2015), Atlanta, Georgia, 2015.
- A. R. Basawapatna, A. Repenning, and K. H. Koh, "Closing The Cyberlearning Loop: Enabling Teachers to Formatively Assess Student Programming Projects," presented at the Special Interest Group of Computer Science Education (SIGCSE 2015), Kansas City, Missouri, 2015.
- Nickerson, H., Brand, C., & Repenning, A. Grounding Computational Thinking Skill Acquisition Through Contextualized Instruction. In Proceedings of the Eleventh International Computing Education Research Conference (ICER 2015, August 9-13, Omaha, Nebraska, USA). New York: ACM Press.
- N. Escherle, D. Assaf, A. Basawapatna, C. Maiello, and A. Repenning, "Launching Swiss Computer Science Education Week," presented at the Proceedings of the 10th Workshop in Primary and Secondary Computing Education, London, U.K., 2015, 11-16.
- Koh, K. H., Nickerson, H., Basawapatna, A., et al. Early validation of Computational Thinking Pattern Analysis. In Proceedings of the Proceedings of the 2014 Conference on Innovation & Technology in Computer Science Education (ITiCSE) (Uppsala, Sweden, 2014). ACM, 213-218.
- Koh, K. H., Basawapatna, A., Nickerson, H., et al. Real Time Assessment of Computational Thinking. In Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC) (Melbourne, Australia, 2014). IEEE,
- Basawapatna, A., Repenning, A., Koh, K. H., et al. The Consume-Create Spectrum: Balancing Convenience and Computational Thinking in STEM Learning. In Proceedings of the Special Interest Group of Computer Science Education (SIGCSE '14) (Atlanta, GA, USA., 2014). ACM,
- A. Repenning, A. Basawapatna, K. H. Koh, and H. Nickerson, "The Zones of Proximal Flow: Guiding Students Through A Space Of Computational Thinking Skills and Challenges," presented at the International Computing Education Research (ICER 2013) Conference, San Diego, CA, 2013, 67-74.



- A. Repenning, A. Basawapatna, and M. Klymkowsky, "Making Educational Games That Work in The Classroom: A new approach for integrating STEM simulations," presented at the IEEE Games Innovation conference (IGIC 2013) Vancouver, British Columbia, Canada, 2013, 228 – 235.
- K. H. Koh, A. Repenning, H. Nickerson, Y. Endo, and P. Motter, "Will it Stick? Exploring the Sustainability of Computational Thinking Education Through Game Design," presented at the ACM Special Interest Group on Computer Science Education Conference (SIGCSE 2013) Conference, Denver, Colorado, USA, 2013, 597-602.
- V. Bennett, K. H. Koh, and A. Repenning, "Computing Creativity: Divergence in Computational Thinking," presented at the ACM Special Interest Group on Computer Science Education Conference (SIGCSE 2013) Conference, Denver, Colorado, USA 2013, 359-364.
- A. R. Basawapatna, A. Repenning, and C. H. Lewis, "The Simulation Creation Toolkit: An Initial Exploration Into Making Programming Accessible While Preserving Computational Thinking " presented at the 44th ACM Technical Symposium on Computer Science Education (SIGCSE 2013), Denver, Colorado, USA, 2013, 501-506.
- A. Repenning, "Conversational Programming: Exploring Interactive Program Analysis," presented at the 2013 ACM International Symposium on New ideas, New Paradigms, and Reflections on Programming & Software (SPLASH/Onward! 13), Indianapolis, Indiana, USA, 2013, 63-74.
- Webb, D. C., Repenning, A., and Koh, K. H., 2012. Toward an Emergent Theory of Broadening Participation in Computer Science Education. In Proceedings of the 43rd ACM technical symposium on Computer Science Education (SIGCSE '12). ACM, New York, NY, USA, 173-178.
- Repenning, A., Smith, C., Owen, B., et al. AgentCubes: Enabling 3D Creativity by Addressing Cognitive and Affective Programming Challenges. In Proceedings of the World Conference on Educational Media and Technology, EdMedia 2012 (Denver, Colorado, USA, June 26-29, 2012) 2762-2771.
- Ahmadi, N., Jazayeri, M. and Repenning, A. Engineering an Open-Web Educational Game Design Environment. In Proceedings of the The 19th Asia-Pacific Software Engineering Conference (APSEC'12) (Hong Kong, December 4-7, 2012). ACM.
- Ahmadi, N., Jazayeri, M. and Repenning, A. Performance Evaluation Of User-Created Open-Web Games. In Proceedings of the 27th Annual ACM Symposium on Applied Computing (Trento, Italy, 2012). ACM, 730-732.
- Koh, K. H., Bennett, V., Repenning, A., Computing Indicators of Creativity, ACM Creativity & Cognition 2011, The High Museum of Art, Atlanta, Georgia, USA, November 3-6, 2011.
- Bennett, V., Koh, K. H., Repenning, A. Can Learning Acquisition be Computed?, in Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing, VL/HCC '11, (Pittsburgh, PA, USA Sept. 18–22, 2011), IEEE Computer Society, Los Alamitos, CA. 243-244.
- Bennett, V., Koh, K. H., Repenning, A., CS Education Re-Kindles Creativity in Public Schools, ITiCSE '11: Annual Conference on Innovation and Technology in Computer Science Education, Darmstadt, Germany, June 27-29, 2011. 183-187.
- Repenning, A., Making Programming more Conversational, in Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing, VL/HCC '11, (Pittsburgh, PA, USA Sept. 18–22, 2011), IEEE Computer Society, Los Alamitos, CA. 191-194.
- Ashok Basawapatna, Kyu Han Koh, Alexander Repenning, David C. Webb, and Krista Sekeres Marshall. 2011. Recognizing computational thinking patterns. In Proceedings of the 42nd ACM technical symposium on Computer science education (SIGCSE '11). ACM, New York, NY, USA, 245-250.
- Koh, K. H., Basawapatna, A., Bennett, V. and Repenning, A. 2010. Towards the Automatic Recognition of Computational Thinking for Adaptive Visual Language Learning. In Proceedings of the Conference on Visual Languages and Human Centric Computing, VL/HCC 2010 (Madrid, Spain, Sept. 21-25, 2010). IEEE Computer Society, Los Alamitos, CA, 59-66. *(acceptance rate: 29.5%). Most Influential Paper Award 2020: Paper that over the last 10 years had the most influence on VL/HCC research or commerce.*

Koh, K. H., Bennett, V., and Repenning, A. 2010. Inspiring Collaborative Benefits: An Interaction Between a Virtual and A Physical Group Learning Infrastructure. In Proceedings of the 15th Western Canadian Conference on Computing Education (Kelowna, British Columbia, Canada, May 07 - 08, 2010). WCCCE '10. ACM, New York, NY, 1-5.

Repenning, A., Webb, D., Ioannidou, A., 2010. Scalable Game Design and the Development of a Checklist for Getting Computational Thinking into Public Schools, In Proceedings of the 41st ACM technical symposium on Computer science education, SIGCSE 2010, (Milwaukee, Wisconsin, USA, March 10 - 13, 2010), ACM, New York, NY, 265-269. (*acceptance rate: 34%*)

Basawapatna A., Koh, K.H., Repenning, A. 2010. Using Scalable Game Design to Teach Computer Science From Middle School to Graduate School. In Proceedings of ITiCSE '10 (Bilkent, Ankara, Turkey, June 26-30, 2010), ACM, New York, NY, 224-228. (*acceptance rate: 51%*)

Basawapatna, A., Repenning, A. 2010. Cyberspace Meets Brick and Mortar: An Investigation into How Students Engage in Peer to Peer Feedback Using Both Cyberlearning and Physical Infrastructures. In Proceedings of ITiCSE '10 (Bilkent, Ankara, Turkey, June 26-30, 2010), ACM, New York, NY, 184-188. (*acceptance rate: 51%*)

Basawapatna, A., Repenning, A. 2010. Visualizing Student Game Design Project Similarities. In Proceedings of Diagrams '10, Lecture Notes in Computer Science, (Portland, Oregon, August 9-11, 2010), Springer Berlin, Heidelberg, 285-287. (*acceptance rate: 34%*)

Alexander Repenning, Andri Ioannidou, David C. Webb, Diane Keyser, Heather MacGillivray, Krista Sekeres Marshall, and Calvin Pohawpatchoko, 2010, Teaching Computational Thinking through Scalable Game Design, Presented at the 2010 American Educational Research Association Annual Meeting (AERA 2010), Denver, Colorado, April 30 - May 4, 2010. (*online only: no page numbers, acceptance rate: 53%*)

Basawapatna, A. Repenning, A. Cyberspace Meets Brick and Mortar: Finding the Sweet Spot between Cyberlearning and Traditional Instruction. Poster Presentation at SIGCSE '10. (Milwaukee, Wisconsin, USA, March 10 - 13, 2010), ACM, New York, NY. (*not published in proceedings, paper acceptance rate: 30%*)

N. Ahmadi, M. Jazayeri, F. Lelli, and A. Repenning. Towards the Web of Applications: Incorporating End User Programming into the Web 2.0 Communities. In *Proceedings of the 2nd international Workshop on Social Software Engineering and Applications* (Amsterdam, The Netherlands, August 24 - 24, 2009). SoSEA '09. ACM, New York, NY, 9-14. (*acceptance rate: 83%*)

Ioannidou, A., Repenning, A. and Webb, D. Using Scalable Game Design to Promote 3D Fluency: Assessing the AgentCubes Incremental 3D End-User Development Framework. In Proceedings of the 2008 IEEE Symposium on Visual Languages and Human-Centric Computing, VL/HCC '08 (Herrsching am Ammersee, Germany, Sept. 15-19 2008), IEEE Computer Society, Los Alamitos, CA, 47-54. (*acceptance rate: 45%*)

Ahmadi, N., Repenning, A. and Ioannidou, A. 2008. Collaborative End-User Development on Handheld Devices. In Proceedings of the 2008 IEEE Symposium on Visual Languages and Human-Centric Computing, VL/HCC '08 (Herrsching am Ammersee, Germany, Sept. 15-19 2008), IEEE Computer Society, Los Alamitos, CA, 237-241. (*acceptance rate: 45%*)

Repenning, A. and Ioannidou, A. Mr Vetro: a Collective Simulation Application for Physiology Education. 12th Annual Meeting of the International Association of Medical Science Educators, IAMSE 2008, (Salt Lake City, Utah, July 25-29, 2008) (*abstract and presentation only, acceptance rate unknown*)

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- Repenning, A. Excuse me, I need better AI!: employing collaborative diffusion to make game AI child's play. In Proceedings of the 2006 ACM SIGGRAPH Symposium on Videogames (Boston, Massachusetts, July 30 - 31, 2006). Sandbox '06. ACM, New York, NY, 169-178 (*acceptance rate: 18%*)
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- Repenning, A. and Ioannidou, A., Mobility Agents: Guiding and Tracking Public Transportation Users. In Proceedings of The 8th International Working Conference on Advanced Visual Interfaces, AVI 2006, (Venezia, Italy, May 23-26, 2006), ACM, New York, NY, 127-134. (*nominated for best paper, acceptance rate: 40%*)
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- Repenning, A. and A. Ioannidou Mr. Vetro: A Collective Simulation Framework. In Proceedings of the ED-Media 2005, World Conference on Educational Multimedia, Hypermedia & Telecommunications, (Montreal, Canada, June 2005) Association for the Advancement of Computing in Education, 1612-1619. (*paper acceptance rate: 20%, paper received highest reviewer scores, invitation to journal paper*)
- Repenning, A., & Sullivan, J. The Pragmatic Web: Agent-Based Multimodal Web Interaction with no Browser in Sight. In Proceedings of the Ninth International Conference on Human-Computer Interaction, INTERACT '03, (Zürich, Switzerland, Sept 1-5, 2003), IOS Press, 212-219. (*acceptance rate: 33%*)
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- Repenning, A. AgentSheets: an Interactive Simulation Environment with End-User Programmable Agents. In Proceedings of the Interaction 2000 Conference, (Tokyo, Japan, Feb. 29- Mar 1, 2000), 1-8. (*keynote address paper*)
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- Repenning, A. Social Behavior Processing: Stepping-Stones between the Use and Design of Behaviors. Presented at Workshop on Software Behavior Description, (St. Thomas, USA, Virgin Islands 1998). *(workshop paper, no printed proceedings)*
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Repenning, A., & Citrin, W. Agentsheets: Applying Grid-Based Spatial Reasoning to Human-Computer Interaction. In Proceedings of the 1993 IEEE Symposium on Visual Languages, VL'93, (Bergen, Norway, Aug. 24-27, 1993), IEEE Computer Society, Los Alamitos, CA, 77-82. *Most Influential Paper Award 2013: Paper that over the last 10 years had the most influence on VL/HCC research or commerce.*

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## Refereed Journals

A. Repenning, N. A. Escherle, and A. Lamprou, "Die ersten 1000: Computational Thinking als obligatorische Ausbildung für Primarschullehrpersonen in der Schweiz (in press)," *MedienPädagogik: Zeitschrift für Theorie und Praxis der Medienbildung*, 2020.

A. Repenning, "Scale or Fail: Moving beyond self-selected computer science education in Switzerland," *Communications of the ACM (CACM)*, vol. 61, pp. 40-42, May 2018.

A. Repenning, A. Lamprou, N. Fahrni, and N. Escherle, "Scalable Game Design Switzerland," *Medienpädagogik und Didaktik der Informatik. Eine Momentaufnahme disziplinärer Bezüge und schulpraktischer Entwicklungen*, pp. 27-52, 2018.

A. Repenning, "[Moving Beyond Syntax: Lessons from 20 Years of Blocks Programming in AgentSheets.](#)" *Journal of Visual Languages and Sentient Systems*, vol. 3, p. 24, 2017.

A. Repenning, D. C. Webb, K. H. Koh, H. Nickerson, S. B. Miller, C. Brand, et al., "Scalable Game Design: A Strategy to Bring Systemic Computer Science Education to Schools through Game Design and Simulation Creation," *Transactions on Computing Education (TOCE)*, vol. 15, pp. 1-31, 2015. *Invited to special issue.*

- Repenning, A., Webb, D. C., Brand, C., et al. Beyond Minecraft: Facilitating Computational Thinking through Modeling and Programming in 3D. *IEEE Computer Graphics and Applications*, 34, 3 (May-June 2014), 68-71. *Invited*
- Repenning A. Making Programming Accessible and Exciting. *IEEE COMPUTER* 46(6): 78-81, Jun 2013. *Invited*
- Repenning, A., Programming Goes Back to School, *Communications of the ACM* (May 2012), 55, 5, pp. 38-40, ACM Press, New York, NY, USA. *Invited, rated popular and (online version only) including embedded video.*
- Repenning, A., Ioannidou, A., Computational Thinking for Game Design, Special Issue on Computational Thinking, The Voice of K-12 Computer Science Education and its Educators (Voice), (May 2011), Computer Science Teacher Association (CSTA), 4-5.
- Ioannidou, A., Repenning, A., Webb, D., Keyser, D., Luhn, L. and Daetwyler, C. Mr. Vetro: A Collective Simulation for teaching health science. *International Journal of Computer-Supported Collaborative Learning, ijCSCL*, 5 (Feb. 2010), International Society of the Learning Sciences (ISLS), 141-166.
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- Repenning, A., Ioannidou, A., & Webb, D. AgentCubes: Incremental 3D End-User Development. *Journal of Visual Languages and Computing, Special Issue on Best Papers from VL/HCC2008*, 20 (4 2009), Elsevier, 236-251.
- Repenning, A. Inflatable Icons: Diffusion-based Interactive Extrusion of 2D Images into 3D Models. *The Journal of Graphical Tools*, 10 (1 2005), A K Peters, Natick, MA, 1-15.
- Repenning, A. and Ioannidou, A. Agent-Based End-User Development. *Communications of the ACM*, 47 (9 2004), ACM, New York, NY, 43-46. *Invited: Special issue on End-User Programming.*
- Ioannidou, A., Repenning, A., Lewis, C., Cherry, G. and Rader, C. Making Constructionism Work in the Classroom. *International Journal of Computers for Mathematical Learning*, 8 (1 2003), Springer, 63-108.
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- Repenning, A. and Ioannidou, A. Engaging Learners through Simulation-Based Design. *Zeitschrift für Hochschuldidaktik, Studienverlag Innsbruck-Wien-München*, 24 (H.1 2001), 47-58. *Invited: Special issue on Computers in medical Education*
- Repenning, A. and Perrone, C. Programming by Analogous Examples. *Communications of the ACM*, 43 (3 2000), ACM, New York, NY, 90-97.
- Repenning, A., Ioannidou, A., & Zola, J. AgentSheets: End-User Programmable Simulation. *Journal of Artificial Societies and Social Simulation*, 3 (3 2000), SimSoc Consortium. *(online journal with no page numbers)*
- Repenning, A., Ioannidou, A., & Phillips, J. Building a Simulation of the Spread of a Virus. *Learning Technology Review, Apple Computer*, (Winter 2000), 56-72.
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- Repenning, A. AgentSheets: End-User Programmable Simulations as Interactive Media. *Logo Exchange*, 18 (1 1999), 19-22.
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- Repenning, A., Ioannidou, A., & Ambach, J. Learn to Communicate and Communicate to Learn. *Journal of Interactive Media in Education*, 98 (7 1998). *(online journal with no page numbers)*

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Ambach, J., Perrone, C., & Repenning, A. Remote Exploratoriums: Combining Networking and Design Environments. *Computers in Education (Special Issue on the Internet in Education)*, 24 (3 1995), 163-176.

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## Magazines

A. Repenning, "From Games to STEM: A Sustainable Path to Broaden Participation," *Computer Science Teaching Association (CSTA) the Voice*, vol. 9, pp. 6-6, July 2013 2013.

## Book Chapters

Repenning, A., A. Lamprou, and P. Wigger, "The Rise of the Digital Polymath: Switzerland Is Crossing the Computer Science Education Chasm Through Mandatory Elementary Pre-Service Teacher Education," in *Handbook of Research on Integrating Computer Science and Computational Thinking in K-12 Education*. vol. 1, J. Keengwe and P. Wachira, Eds., ed: IGI Global, 2019, pp. 191-219.

Repenning A., Basawapatna A.R., and E. N.A., "[Principles of Computational Thinking Tools](#)," in [Emerging Research, Practice, and Policy on Computational Thinking](#). Educational Communications and Technology: Issues and Innovations, H. C. Rich P., Ed., ed: Springer, Cham, 2017, pp. pp 291-305.

A. Repenning, "Smart Education durch Computational Thinking in der Primarschule," in *Smart City: Strategie, Governance und Projekte*, A. Meier and E. Portmann, Eds., ed: Springer Vieweg, 2016, pp. 201-219.

Lewis, C. and Repenning, A. Creating Educational Gamelets. In DiGiano, C., Goldman, S. and Chorost, M. eds. *Educating Learning Technology Designers: Guiding and Inspiring Creators of Innovative Educational Tools*, Routledge, 2008, 200-229. 362 pages.

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Repenning, A., & Perrone, C. Programming by Analogous Examples. In H. Lieberman (Ed.), *Your Wish Is My Command: Programming by Example*, 2001, Morgan Kaufmann Publishers, 90-97, 390 pages.

## Blogs

A. Repenning, "Die Schweiz auf der digitalen Überholspur," in Swiss Science Council, ed. Swiss Science Council, 2018.

## Refereed Symposia

Repenning, A. (chair), Lee, I. (discussant), Ioannidou, A., Bennet, V., Koh, K., Basawapatna, A., Webb, D., Macgilivray, H., Denner, J., Werner, L., Marshall, K., Merging Human Creativity and the Power of Technology: Computational Thinking in the K-12 Classroom, American Educational Research Association, (New Orleans, Louisiana, <sup>[1]</sup><sub>SEP</sub>April 8 - 12, 2011).

Malyn-Smith, J. (chair), Lee I. (discussant), Denner J., Shannon, C., Panoff, R., Werner, L., Siobhan, B., Computational Thinking - Progress in Defining, Supporting and Measuring Computational Thinking in Projects Funded by NSF's Division of Research on Learning. American Educational Research Association, (New Orleans, Louisiana, <sup>[1]</sup><sub>SEP</sub>April 8 - 12, 2011).

## Unrefereed Conference Proceedings

Repenning, A. & Lewis, C., (2005). Playing a Game: The Ecology of Designing, Building and Testing Games as Educational Activities. Ed-Media World Conference on Educational Multimedia, Hypermedia & Telecommunications, Montreal, Canada.

Repenning, A. (2001). The Role of Simulation in Creativity. In International Symposium on Social Creativity and Meta-Design, Aspen, Colorado.

Repenning, A. (1999, May 27-30, 1999). Consumers  $\Leftrightarrow$  Producers versus Use  $\Leftrightarrow$  Design. In PFU L3D Workshop 1999, Breckenridge, CO.

## Technical Reports, Videos

Repenning, A., & Ambach, J. (1996). Visual AgenTalk: Anatomy of a Low Threshold, High Ceiling End User Programming Environment (Technical Report CU-CS-802-96): Department of Computer Science, University of Colorado.

Repenning, A. (1994). Agentsheets: The Manual (Technical Report CU-CS-699-94): University of Colorado at Boulder.

Repenning, A. (1993). 1993 World Wide Developers Conference, ATG Extravaganza: Agentsheets [live presentation to 5000 people + Video]. Cupertino, CA: Apple Computer Inc.

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Repenning, A. (1987). Repräsentation von graphischen Objekten (Research Report CRB 87-84 C): Asea Brown Boveri Research Center, Artificial Intelligence group, Dätwill 5405, Switzerland.

## Patents

Conversational Programming, United States Patent and Trademark Office, Protected by U.S. Patent No. 8,645,914, granted February 4, 2014.

Diffusion-based Interactive Extrusion of Two-Dimensional Images into Three-Dimensional Models, United States Patent and Trademark Office, Protected by U.S. Patent No. 8,116,591, granted February 14, 2012.

Diffusion-based Interactive Extrusion of Two-Dimensional Images into Three-Dimensional Models, United States Patent and Trademark Office, Protected by U.S. Patent No. 7,995,863, granted August 9, 2011.

Diffusion-based Interactive Extrusion of Two-Dimensional Images into Three-Dimensional Models, United States Patent and Trademark Office, 2004, Protected by U.S. Patent No. 7,630,580, granted December 8, 2009.

“Verfahren zur Ausführung von zwei in verschiedenen Programmiersprachen geschriebenen Programmen.”  
Application for Letters Patent in Germany: Sept. 22, 1986, Identification P 36 32 139.7; Assignment of U.S. Rights to Invention: Oct. 9, 1986.

## Committees

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2023), Washington, DC, USA, October 2 - 6, **2023**



Program Committee: The 18th WiPSCE Conference on Primary and Secondary Computing Education Research (WiPSCE 2023), Cambridge, England, September 27 - 29, **2023**

Program Committee: ACM International Computing Education Research (ICER' 22) conference, Lugano, Switzerland, August 7-11, **2022**.

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, Rome, Italy, September 12-16, **2022**

Program Committee: ACM International Computing Education Research (ICER' 21) conference, (online), August 16-19, **2021**.

Program Committee: ACM International Computing Education Research (ICER' 20) conference, (online), August 8-13, **2020**.

Program Committee: ACM International Computing Education Research (ICER' 19) conference, Toronto, ON, Canada, August 12-14, **2019**.

Program Committee: ACM 25th annual conference on Innovation and Technology in Computer Science Education (ITiCSE), Trondheim, Norway, June 17-18, **2020**.

Reviewer: 17<sup>th</sup> ACM Interaction Design and Children (IDC) Conference, Trondheim, Norway. 19-22 June **2018**

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, August 11-14, 2020, Dunedin, New Zealand.

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, October 14-18, 2019, Memphis, Tennessee, USA.

Program Committee: Blocks and Beyond, Workshop on Lessons and Directions for First Programming Environments, a VL/HCC 2019 workshop in Memphis, TN, USA, Oct. 18, 2019

Program Committee: Blocks and Beyond 2, 2nd Workshop on Lessons and Directions for First Programming Environments, a VL/HCC 2017 workshop in Raleigh, NC, USA, Oct. 10, 2017

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, October 11 -14, 2017, Raleigh, North Carolina, USA.

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, September 4-7, 2016, Cambridge, UK.

Program Committee: Blocks and Beyond Lessons and Directions for First Programming Environments, 2015 workshop in Atlanta, Oct. 22, 2015.

Program Committee: RESPECT 2015, Research in Equity and Sustained Participation in Engineering, Computing, and Technology, Charlotte, NC, August 13-14, 2015.

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, October 18-22, 2015, Atlanta, Georgia, USA.

Program Committee: Fifth International Symposium on End-User Development, (IS-EUD), Madrid, Spain, May 26-29, 2015.

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, 2014, Melbourne, Australia.

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, 2013, San Jose, CA, USA.

Program Committee: Fourth International Symposium on End-User Development, (IS-EUD), Copenhagen, Denmark, 2013.

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, 2012.

Program Committee: Third International Symposium on End-User Development, (IS-EUD), Torre Canne, Italy, 2011.

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, 2010.

Program Committee: The 9<sup>th</sup> International Conference on Interaction Design and Children, Barcelona, Spain, 2009.

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, 2009.

Program Committee: The 8<sup>th</sup> International Conference on Interaction Design and Children, Como, Italy, 2009.

Program Committee: IEEE Symposium on Visual Languages and Human-Centric Computing, 2008.

Program Committee: Second Symposium on EUD (EUD 2009) in March 2009 in Siegen, Germany.

Program Committee: OOPSLA 2007.

Program Committee: SIGGRAPH Sandbox 2007.

Program Committee: Pragmatic Web Conference 2006, Stuttgart, Germany.

Program Committee: International Conference on Computational Science and Education 2006, Engaging People in Cyberinfrastructure and <sup>(SEP)</sup>Role of Computational Technology in Research & Education, Rochester, New York

Program Committee: INTERACT 2003, International Conference on Human-Computer Interaction, Zürich, Switzerland.

Program Committee: VL 2000 IEEE Workshop on Visual Languages

NSF Initiative planning on Complex Systems in Education, 1999

Program Committee: Visual End-User '99, Workshop on End-User Programming

Program Committee: VL '98 IEEE Workshop on Visual Languages

Program Committee: VL '97 IEEE Workshop on Visual Languages

Program Committee: VL '96 IEEE Workshop on Visual Languages

Program Committee: Human Centric Computing 2003, New Zealand

## Workshop Organization

### Peer Reviewed Workshops

Instructor, Computational Thinking: from Game Design to STEM in One Week, 2014 CSTA Annual Conference, St. Charles, Illinois, USA, July 14-15, 2014.

Instructor, Teach Your Students 3D Game Design in One Week, International Society for Technology in Education Conference (ISTE 2013), 3 hour workshop, June 23-26, San Antonio, Texas, USA.

Instructor, Computational Thinking: from Game Design to STEM in One Week, 2013 CSTA Annual Conference, July 15-16, 2013, Boston Marriott Quincy, Quincy, Massachusetts, USA.

Instructor, Teach Your Students Game Design in One Week, International Society for Technology in Education Conference (ISTE 2012), 190 registered participants, June 24-27, San Diego, California, USA.

Instructor, Teach Your Students Game Design in One Week, International Society for Technology in Education Conference (ISTE 2011), 92 registered participants, June 26-29, Philadelphia, Pennsylvania, USA. (reviews: 5.9/6.0)

Instructor, with Mark Shouldice, Teaching Game Design, Technology in Education (TIE Colorado 2011) Conference, June 19-21, Copper Mountain, Colorado, USA.

Instructor, with Lewis, C., Workshop: Gamelet Design for Education. In Annual Games, Learning & Society Conference (GLS 2006), (Madison, Wisconsin, 2006).

Co-Chair, symposium: Challenges in Developing Authentic, Multi-University, Cross-Disciplinary, Design-Based Courses, ED-Media, 2005, Montreal, Canada.

Instructor, tutorial: Game Design for Education, IDC 2005, 4<sup>th</sup> International Conference for Interaction Design and Children, Boulder, Colorado.

Co-Chair: End-User Development, CHI 2003, Fort Lauderdale.

Instructor: Agent-Based Simulations, SC2002, Super Computing, Baltimore.

Chair: Symposium on End-User Programming, Stresa, Italy, 2001.

Chair: Child's Play '96, Conference on End-User Programming and Education, Boulder, CO, 1996.

Co-Chair: Visual Language Challenge '97, Isle of Capri, Italy, 1997.

Co-Chair: Child's Play '95, Workshop on End-User Programming and Education, Boulder, CO, 1995.

## **Invited Workshops**

Teacher Professional Development, Scalable Game Design New York, funded by NYC Foundation for Computer Science Education (Fred Wilson), July 30-August 1, Google New York. 2014.

Scalable Game Design workshop, School of Education, Lucern, Switzerland, June 26, 2014.

10 Year Anniversary Event at Google Zürich, Scalable Game Design Workshop with almost 200 students and teachers, May 21, 2014.

Scalable Game Design workshop for kids, Collaboration with ETH Zürich, Dietlikon. March 24, 2014.

Teacher training workshop, Schweizer Tag für den Informatikunterricht, Kantonsschule Aargau, Aarau, Switzerland, Jan 6, 2014 (largest workshop: out of 150 teachers with 10 workshops we got 47 teachers).

Teacher training workshop, Schweizer Tag für den Informatikunterricht, Kantonsschule Limmattal, Urdorf, Switzerland, Jan 11, 2013.

Teacher training workshop, ETH Zürich, Ausbildungs-und Beratungszentrum für Informatikunterricht (ABZ), Zürich, Switzerland, November 28, 2012.

Teach Your Students Game Design in One Week, Middle Tennessee State University, Murfreesboro, TN, Nov. 4, 2011.

Game Design with AgentSheets, Stanford University, Department of Education, April 15, 2003.

Game Programming, Full day workshop for Japanese kids age 8-12 to build games, sponsored by the Japanese International Media Research Foundation, NTT InterCommunication Center, Tokyo, June 29, 2002.

How to make your own interactive web game, MIT Media lab, Mindfest, Boston, MA, 1999.

Introduction to Simulation Design, Engineering School Open House, University of Colorado, Boulder, CO, 1999 and 2001.

## Hearings

Expert at hearing for “Computer Science at High Schools” Schweizerischen Konferenz der kantonalen Erziehungsdirektoren (EDK), Bern, Switzerland, August 21, 2014.

## Art Exhibits

Art.Bit Collection, Tokyo Opera City Tower, Connecting Programming with Art, Tokyo, Japan, curator: Kouichirou Eto, June 21 - August 11, 2002.

Fine Art Front Porch Fall Series, University of Colorado, “Programmable LEGO and Fine Art”, Boulder, CO, October, 10, 1996.

## Reviewer for

### National Grant Organizations

- NSF Computing Education for the 21<sup>st</sup> Century
- NSF Innovative Technology Experiences for Students and Teachers (ITEST Scale up)
- NSF Innovative Technology Experiences for Students and Teachers (ITEST)
- NSF Information Technology Research (ITR)
- NSF Human Computer Interaction & Universal Access (HCI & UA)
- NSF Interactive Systems (IS)
- NSF Small Business Innovation Research (SBIR)
- NSF CAREER Program
- NSF Partnerships for Innovation (PFI)
- NIH National Institute on Drug Abuse

### International Grant Organizations

- SNF, Swiss National Science Foundation
- FWF, Austrian Fonds zur Förderung der wissenschaftlichen Forschung
- ISF, Israel Science Foundation
- RGC, Hong Kong Research Grants Council
- NSERC, Natural Sciences and Engineering Research Council of Canada
- NWO, the Netherlands Organization for Scientific Research

### Private Grant Organizations

The John D. and Catherine T. MacArthur Foundation  
The Hasler Foundation

### Journals

- Journal of Visual Languages & Computing
- ACM Computing Surveys
- Communications of the ACM
- Human-Computer Interaction
- International Journal of Human-Computer Studies
- Journal of Interactive Learning Environments
- ACM Transactions on Computer-Human Interaction

- IBM Systems Journal
- Simulation Modelling Practice and Theory
- IEEE Computational Science & Engineering
- International Journal of Visual Languages
- Journal for Research in Mathematics Education
- Journal of Organizational and End User Computing
- Information & Software Technology

## Conferences

- ACM International Computing Education Research (ICER) conference 2019
- IEEE Visual Languages and Human Centric Computing (VL/HCC), 2019, 2018, 2017, 2016, 2015, 2014, 2013, 2012, 2011, 2010, 2009
- Blocks and Beyond: Lessons and Directions for First Programming Environments, 2019, 2017, 2015
- Research in Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT), 2015
- User Interface Software and Technology, UIST, 2013, 2014
- Symposium on End-User Development (IS-EUD), 2011
- Desire Conference on Creativity and Innovation in Design (Desire), 2011
- Computer Human Interaction (CHI '09), Boston, USA, April 2009
- Computer Human Interaction (CHI '08), Florence, Italy, April 2008
- Information Systems (ECIS'06). Göteborg, Sweden, June 2006
- IEEE Visual Languages
- International Conference on Human-Computer Interaction
- International Conference On User Modeling

## Book Publishers

- Manning Publications Co.

## Advisory Boards

- 2014: University of Wyoming, ITEST NSF Project.

## Invited Presentations

**Talk:** “Computational Thinking ≠ Programming: The Rise of the Digital Polymath,” Oltener Kreis, Olten, Switzerland, April 25, 2018.

**Talk:** “Computational Thinking ≠ Programming,” Swiss Federal Institute of Technology Zürich (ETHZ), Zürich, Switzerland, April 11, 2018.

**Talk:** “Scalable Game Design: Crossing the Computer Science Education Chasm,” Swiss Academy of Sciences, Bern, Switzerland, Feb. 8, 2018.

**Keynote:** “Digitale Lebenswelten im Unterrichtsalltag einbinden und nutzen,” Fachtag: Lernräume digital gestalten“ des Programms „LiGa - Lernen im Ganztag“, “39326 Wolmirstedt, Germany, Oct. 26, 2017.

**Colloquium:** “Programming is Hard and Boring: Addressing Cognitive and Affective Challenges in Computer Science Education”, University of Colorado, Boulder, U.S.A., Feb. 25, 2016. [video](#)

**Colloquium:** “Programming is Hard and Boring: Addressing Cognitive and Affective Challenges in Computer Science Education”, EPFL, Department of Computer Science, Lausanne, Switzerland, Dec. 14, 2015.

**Keynote,** “Computer Science Education in Swiss Elementary Schools”, Informatik in der Bildung, Abschluss des Förderprogramms FIT und Perspektiven für die Zukunft. Bern, Switzerland, April 21, 2015.

**Inaugural Session**, “Don’t be a memory stick: Programming learning for school children”, European Congress on e-Cardiology & e-Health, Bern, Switzerland, October 29 - 31, 2014.

**Computer Science Faculty Talk**, “Programming is Hard & Boring,” ETH Zürich, Zürich, Switzerland, October 20, 2014.

**Talk**, “Creating Computational Thinkers”, International School Basel (ISB), September 18, Basel, Switzerland.

**Radio Interview**: Colorado professor out to prove computer coding isn’t just a guy thing, Colorado Public Radio (NPR), Colorado Matters, April 2, 2014, Centennial, Colorado, USA.

**Keynote**: CEPIS – “Broadening participation by integrating game design into public school curricula,” Council of European Professional Informatics Societies, Geneva, Switzerland, April 4, 2013.

**Keynote**: “Excuse me, I need better Artificial Intelligence!” Igniting Students’ Intrinsic Math Motivation through Game Design, eMINTS Annual Conference, Columbia, Missouri, Feb. 26-28, 2014.

**Presentation and Workshop**: St. Vrain Valley’s Innovation Center, student hackathon Dec. 6, 7, 2013, Longmont, Colorado, USA.

**Demo**: “Scalable Game Design”, New York Tech Meetup (directed by the founder of Meetup), Skirball Theater, New York, NY, Nov. 4, 2013. *Live audience 850 + remote audience ~2000.*

**Keynote**: ““Excuse me, I need better Artificial Intelligence!” Igniting Students’ Intrinsic Math Motivation through Game Design,” 4th International Realistic Math Education (RME) Conference Sept 27-29, 2013, University of Colorado, Boulder, USA.

**Keynote**: “Programming is Hard & Boring” Addressing Cognitive and Affective Challenges in Computer Science Education, Schweizer Informatik-Olympiade (Swiss Computer Science Olympics) 2013, Swiss Federal Institute of Technology Zürich (ETH), Jan 12, 2013, Zürich, Switzerland. *Last years keynote was given by Turing award Winner Donald E. Knuth.*

**Keynote**: “Programming is Hard & Boring” Addressing Cognitive and Affective Challenges in Computer Science Education, The Consortium for Computing Sciences in Colleges: Rocky Mountain Conference (CCSC), Oct. 12, Denver, Colorado. 2012.

Colloquium, Social Computational Thinking Tools: Reinventing Computation Education in Public Schools, Middle Tennessee State University, Computer Science Department, Nov. 4, 2011, Murfreesboro, TN, USA.

**Keynote**: Social Computational Thinking Tools: Reinventing Computation Education in Public Schools, The Brazilian HCI Conference (IHC 2011) and 5th Latin American HCI Conference (CLIHC 2011), Oct. 26, 2011, Porto de Galinhas, Pernambuco, Brazil.

Colloquium, Social Computational Thinking Tools: Reinventing Computation Education in Public Schools, Universidade Federal de Pernambuco (UFPE), Computer Science Department, Oct. 24, 2011, Recife, Pernambuco, Brazil. *UFPE is rated 6/7 (very high) in the Brazilian University rating system.*

Colloquium, Social Computational Thinking Tools: Reinventing Computation Education in Public Schools, Pontificia Universidade Católica do Rio de Janeiro (PUC RIO), Computer Science Department, Oct. 20, 2011, Rio de Janeiro, Brazil. *PUC RIO is rated 7/7 (top) in the Brazilian University rating system.*

Presentation with Susan Johnson, “Using Visualization Tools to Teach Programming”, 94th Annual Summer Conference, Colorado Association of Career and Technical Education, July 21, 2011, Loveland Colorado, USA.

**Presidential Session**, Social Computational Thinking Tools, Design Research Exploring Transformative Frameworks for Learning and Education, American Educational Research Association Annual Meeting, April 10, 2011, New Orleans, LA, USA.

Presentation, Scalable Game Design, STEM Science Technology Engineering & Math (STEM) Education Coalition, Oct. 4, 2010, CSU Denver Downtown Campus, Denver, CO, USA.

**Honoree Presentation**, Repenning is honored for contributions to computer science at the 2010 Telluride Tech Festival, Oct. 2, Telluride, CO, USA. (*Past honorees include Sir Tim Berners-Lee (creator of the World Wide Web), Vinton Cerf (father of the Internet), and Alan Kay (Turing Award recipient and inventor of modern object-oriented programming).*)

Presenter, SIGDE Forum: The Digital Generation, the Digital Divide, the Mobile Divide, the Literacy Divide, ISTE 2010, June 28, 2010. Denver, CO, USA.

**Keynote**: “Learning by Making Games”, A Blue Print for STEM, June 27, 2010, Denver School of Science and Technology, a pre-ISTE conference, Denver, CO, USA.

Invited Lecture: School of Mines, “Writing Motivational Project Proposals”, November 6, 2009, Golden, CO, USA.

National Science Foundation brown bag, Computational Thinking Talk series, “Computational Thinking Tools for Scalable Game Design”, July 1, 2009, Arlington, WV, USA.

University of Bern, “Computational Thinking Tools for Scalable Game Design”, June 22, 2009, Bern, Switzerland.

Pannel: University of Denver, Bridges to the Future event, “Scalable Game Design”, March 31, 2009, Denver, CO, USA.

**Keynote**: ECOOP/ELW 2007, “Antiobjects: Mapping Game AI to Massively Parallel Architectures using Collaborative Diffusion”, July 30, 2007, Berlin, Germany.

**Keynote**: ICT in Education 2007, “Beyond Individualized Instruction”, May 7, 2007, Island of Syros, Greece.

Talk: ICT in Education 2007, “IT Fluency through Game-Based Design”, May 8, 2007, Island of Syros, Greece.

Talk: ETH Zürich, “Antiobjects: Mapping Game AI to Massively Parallel Architectures using Collaborative Diffusion”, April 30, 2007, Zürich, Switzerland.

Colloquium: Carnegie Mellon University, “Antiobjects: Mapping Game AI to Massively Parallel Architectures using Collaborative Diffusion”, April 27, 2007, Pittsburgh, USA.

Colloquium: University of Memphis, “Antiobjects: Mapping Game AI to Massively Parallel Architectures using Collaborative Diffusion”, April 20, 2007, Memphis, USA.

Demonstration: Schloss Dagstuhl, “Incremental 3D End-User Development”, Feb. 20, 2007, Germany

Colloquium: University of Geneva, “Video Games meet Ubiquitous Computing: The Collective Simulation of a Human Being”, Dec. 7, 2006, Geneva, Switzerland.

Colloquium: EPFL Lausanne, “Video Games meet Ubiquitous Computing: The Collective Simulation of a Human Being”, Dec. 13, 2006, Lausanne, Switzerland.

Colloquium: Oregon State University, “Antiobjects”, Oct. 23, 2006, Corvallis, Oregon, USA.

IDSIA (Istituto Dalle Molle di Studi sull'Intelligenza Artificiale), “Excuse me, I need better AI!”, Oct. 12, 2006, Manno, Switzerland.

Colloquium: University of Lugano, Early Steps Towards Cyberinfrastructure enhanced End-User Development, May 11, 2006, Lugano, Switzerland.

University of Lugano, End-User Programmable Agents: of Programmable Services, Toys and Games, Dec. 16, 2005, Lugano, Switzerland.

Deutsches Institut für Erwachsenenbildung, Simulations for the International Assessment of Adult Competencies (PIAAC), Sept 12-13, 2005, Bonn, Germany.

6<sup>th</sup> Annual International Symposium On Advanced Radio Technologies , “Wireless Technologies to Support People with Cognitive Disabilities on Public Transportation Systems”, March 2-4, 2004, Boulder, CO.

Technology, Neuroscience and the Future of Cognitive Disability, “Commercialization and the SBIR Model”, October 9-10, 2003, Denver, CO.

Media X Gaming to Learn conference, audience included: education researchers, professional game designers, and funding officers (NSF, Hewlett foundation, MacArthur foundation), September 18-19, 2003, Stanford University, Palo Alto, CA.

**Keynote** presentation to funding officers of the European Research Commission and the Germany Science Foundation: International Symposium on End User Development, Schloss Birlinghoven, Sankt Augustin (Bonn), Germany, October 7-8, 2003.

European Network of Excellence on End-User Development, End-User Development– Who needs it? Pisa, Italy, September 20, 2002.

NTT InterCommunication Center, “Programming meets Art”, Tokyo, June 30, 2002.

Institute for the Advancement of Emerging Technologies in Education, The Constructivist Software Struggle – Constructivist Software in a Dog-Eat-Dog Market, panel with Seymour Papert , Dave Benoit, Ann H. McCormick, and Alexander Repenning, Charleston, WV , May, 2002.

University of Tokyo, AI group, “Thought Amplification”, Tokyo, Japan, June 28, 2002.

Toshiba R&D Center, “Multimodal Speech Interfaces meet the Web,” Kawasaki, Japan, Jan 25, 2002.

Google, Machine Learning Group, “Agent-based Voice Portals to the Web”, Mountain View, CA, November 30, 2001.

NASA Ames, Research Institute for Advanced Computer Science Colloquium, “The End-User Programmable Web”, Moffett Field, CA, November 29, 2001.

National Academy of Sciences, “Using Simulations in K-12 Education”, Washington, DC, January, 24, 2001.

National Educational Computing Conference (NECC), “Producing Interactive Problems of the Week: Component-Based Integration Teams”, Chicago, IL, June 26, 2001.

European Commission, ITS 2001, “The Pragmatic Web”, Düsseldorf, Germany, December 4, 2001.

International Symposium On Social Creativity and Meta-Design, “The Role of Simulation in Creativity”, Aspen, CO, May 8, 2001.

National Science Foundation, Workshop to Integrate Computer-based Modeling and Scientific Visualization into K-12 Teacher Education Programs, NCSA ACCESS center, Ballston, VA, October 25-26, 2000.

**Keynote** address, Interaction 2000, Asia largest HCI conference, “AgentSheets: an Interactive Simulation Environment with End-User Programmable Agents,” Tokyo, February 29, 2000.

Nara Advanced Institute of Science and Technology, Nara, Japan, March 4, 2000.

NTT Communications Science Laboratory, Kyoto, Japan, March 3, 2000.

Panasonic/Fujitsu (PFU) Research Center, Tokyo, March 1, 2000.

Advanced Telecommunications Research Institute (ATR), Kyoto, March 2, 2000.

Software Research Associates (SRA), Tokyo, February 28, 2000.

Sony CSL Lab, Tokyo, February 28, 2000.

Apple Computer Inc. @ Macworld 2000, “The use of simulation tools in science,” San Francisco, CA, January, 2000.



MIT Media Lab, Panel with Andi DiSessa and Brian Silverman on “Kids and Programming,” Boston, MA, 1999.

PFU L3D Workshop, “Consumers  $\Leftrightarrow$  Producers versus Use  $\Leftrightarrow$  Design,” 1999, Breckenridge, CO, 1999.

University of Duisburg, “Agent-Based Interactive Simulations”, Duisburg, Germany, April 14, 1999.

Fraunhofer Institute, “Agent-Based Interactive Simulations”, Darmstadt, Germany, April 13, 1999.

University of Colorado, Mervyn Young Memorial Lecture Series, “Agents in Simulations and Games”, Boulder, CO, October 15, 1998.

Carnegie Mellon University, Human Computer Interaction Institute Colloquium, “End-User Programmable Agents”, Pittsburgh, PA, April 7, 8, 1998.

Keynote address, Psychology of Programming, “Programming For The Rest Of Us: Lessons Learned From Programmers Who Do Not Want To Be Programmers,” Milton Keynes, England, January 10, 1998.

The 1998 Conference on Virtual Worlds and Simulation, "Ristretto: Creating Agent-Based simulations in Java", San Diego, California, January 11, 1998.

Apple Computer, Workshop on Knowledge for Development for Representatives from the White House, “Educational Media in the next Millenium”, Cupertino, California, Nov. 12, 1997.

Georgia Tech Workshop On Educational Component Software, “From Agents to Components”, Atlanta, GA, June 25, 1997.

Workshop On Model Building As Part of Science Learning, "Educational Simulation Design", Boulder, CO, June 26, 1997.

Sun Microsystems, Educational Components in Java Teacher Workshop, “Designing Interactive Simulations”, Menlo Park, California, June 24, 1997.

LEGO Headquarters, "End-User Programmable Tools & Toys", Billund, Denmark, Oct 9, 1997.

Swiss Federal Institute for Environmental Science and Technology, EAWAG, “The Use of Agents in Environmental Simulations”, Dübendorf, Switzerland, Oct. 22, 1997.

Marvin Minsky's MIT Media Lab Spring Colloquium Series, “Tactile Programming: A Unified Manipulation Paradigm Supporting Program Comprehension, Composition and Sharing”, Boston, MA, April 24, 1996.

GMD Darmstadt, Presentation of Agentsheets and LEGOsheets, Darmstadt, Germany, Sept. 4, 1995.

GMD Bonn, Presentation of Agentsheets and LEGOsheets, Bonn, Germany, Sept. 1, 1995.

University of Bremen, Presentation of Agentsheets and LEGOsheets, Bremen, Germany, Sept. 13, 1995.

Alan Kay's Apple Hill Workshop on Computers and Education, “Agentsheets as Constructionist Environment”, Apple Hill, NH, August 28, 1995.

MIT Media Lab, “Agentsheets: A Substrate to create Domain-Oriented Programming and Simulation Environments”, Boston, MA, April 21, 1994.

Apple Computer Inc., Advanced Technology Group,: “Building Agent-Based Applications”, Apple World Wide Developers Conference, Advanced Technologies Extravaganza, (audience ~4000 people), San Jose, CA, 1993. Apple presented demonstrations of Agentsheets at conferences in Frankfurt, Germany, June 14, and Deauville, France, June 21, 1993.

## Reviewed Talks and Posters

Poster: Scalable Game Design: Effectively Teach Computer Education in Middle Schools, National Educational Computing Conference, NECC 2009, June 30, 2009, Washington, DC, USA.

Talk (1 hour): Scalable Game Design: Effectively Teach Computer Education in Middle Schools, National Educational Computing Conference, NECC 2009, July 1, 2009, Washington, DC, USA.

## Open Source Projects

Created and maintained a number of Open Source projects under the LGPL license for simulation authoring tools including XMLisp, The Open Agent Engine, speech recognition wrappers, GamePad interfaces and various Lisp programming tools including anticipatory symbol completion. Many of these tools have been ported to other hardware and software platforms.

Google Code project: <http://code.google.com/p/xmlisp/>

## Synergistic Activities

*Development of research tools:* Developed the AgentSheets simulation-authoring tool. Tool allows end-users to build complex agent-based simulations and publish them as Java applets or JavaBean software components. An international user community includes students and teachers in K-12 & university, government research organizations (e.g., NASA), and private sector. Simulations have been built for a variety of subjects including physics, mathematics, sociology, electricity, chemistry, mechanics, environmental design, politics, and economics. With partial NSF/SBIR support AgentSheets has been turned into a commercial product. AgentSheets is currently localized into non-English languages including Japanese.

*Innovations in teaching:* In collaboration with SRI International, the Mathforum/WebCT, and the University of Massachusetts interactive (AgentSheets-based) middle school math activities are produced and published in support of the Connected Math curriculum. Explore the use of software component technology to build effective educational materials. Research the process of component-based rapid distributed software development.

*Development of databases to support research and education:* Founding member of the Educational Object Economy <http://www.eoe.org>. Collaborated with Apple Computer, Houghton Mifflin Company, PWS, Stanford University, University of Massachusetts at Amherst, and Carnegie Mellon University to build Java authoring tools and seed EOE repository. EOE is largest database of educational Java applets on the Web.

*Contributions to the science of learning:* Chaired and co-chaired several workshops on end-user programming, simulation authoring in education, and assessment issues in constructivist learning. Initiated outreach activities for computer science students (undergraduates and graduates) to work on educational technology, work in local middle and high schools, present their work at international conferences and to collaborate with educational technology companies including the LEGO toy company and Apple.

*Service on national boards and committees.* Participate in a variety of planning meetings on national research programs including the National Academy of Sciences, Definition of A National Initiative Using Technology In K-16 Education, and Building the Educational Grid for Pre-Service Training. Programming committee member and reviewer for education and end-user programming oriented journals/conferences. Reviewer for national (e.g., NSF) as well as international (e.g., Hong Kong Research Grants Council) research funding organizations.

## Collaborators & Other Affiliations

*Collaborators.* NSF Grant: Jeremy Rochelle, Chris DiGiano, Roy Pea - SRI International - James Kaput - University of Massachusetts. Book: Henry Lieberman - MIT Media Lab.

*Graduate Advisor.* Clayton Lewis, University of Colorado.

## Teaching Achievements

Software Atelier II at the University of Lugano was ranked 2/15 of all Spring 2007 Informatics courses.

Repenning's general approach to teaching is to involve undergraduate as well as graduate students in authentic projects and research opportunities connecting them with real world problems. Students are encouraged to participate in outreach activities providing content, tools and services to communities. Examples:

*A senior project team designed a visual programming language* for the MIT programmable brick called LegoSheets in collaboration with researchers at the MIT Media lab. Undergraduate students learned:

- how to collaborate with researchers locally (at University of Colorado) and at a distance (MIT Media Lab).
- to design complex software by using user-centered design. Students worked with middle schools students at local school to design language, build prototypes, test and revise software. Students volunteered to spend significant amounts of time in the Computer Club advising kids on using computers, building robots and constructing programmable cars.
- to give presentations and write research papers. The team got a paper (regular not student category) accepted at the Visual Languages '95 symposium in Darmstadt, Germany. Students got awarded price allowing them to travel to Germany and present paper. Presentation was well received and led to an annual, partially NSF supported, event at the Symposium called the Lego Visual Programming Challenge.

*A group of undergraduate and graduate students worked with high school students to build simulations in social studies.* High school students built and published dozens of complete simulations of events in American history including The Montgomery Bus Boycott, The Flint Strike, and The Californian Grape Boycott. One of the high school teams was awarded with a trip to Atlanta to present their work at a conference on technology in education. The simulations published on the Web became subject of a small media debate in Germany resulting in several articles in German newspapers discussing the progressive use of interactive media in education in the USA.

*Graduate students collaborated with teachers, developers and publishers to build course material.* Students attended workshops designing interactive middle school math content for the MathForum. They learned about the complete software development cycle including component-based design, distributed development, prototyping, versioning, and bug testing. Content produced was published on the MathForum and on Public Broadcast System (PBS) Web pages.

Students working on these projects received recognition in industry and research. Several groups got invited to present their work in Silicon Valley, and at research conferences. Two undergraduates graduated as best students in the engineering program, and three students received best engineering project price.

**Courses Taught:** Artificial Intelligence, Object-Oriented Design & Analysis, Information Technology for Education, Senior Projects, Game Programming, Game Design; University of Lugano: Computer Graphics, Simulation & Scientific Visualization, Software Atelier II

**Teaching Outreach:** University of Colorado High School Honors Institute, representing Computer Science department: game design workshops; University of Colorado Science Discovery Center: course on scientific simulation building; University of Colorado SMART Program<sup>[17]</sup>, Summer Multicultural Access to Research Training: advised summer students; Centennial Middle School, Boulder, Colorado: computer science course on game design; CU Upward Bound Program: a 6 week course in game design for residential summer students from native Indian reservations.

**Thesis Advisor:** Martin Rausch, Braden Craig, Jonathan Phillips, Andri Ioannidou, Wenming Ye, and Oliver Leukel, Jennifer Turney, Kavita Agrawal, Catherina Poggi, Politecnico di Milano & USI Communication.

## Letters of Recommendation

Available upon request

## Languages

English, German, and Swiss German: fluent

Italian: able to participate in casual conversation

## Hobbies

Mountain biking