

Matthew Guzdial**Ph.D. Candidate, Georgia Institute of Technology**CONTACT
INFORMATION

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RESEARCH AREAS

My research focuses on creative artificial intelligence and machine learning, with two major research vectors. The first is the application of AI/ML to domains we would typically consider requiring human creativity, which exposes limitations and potential for development of current AI/ML approaches. The second is the application of computational models of creativity to standard AI/ML tasks to improve the performance on these tasks.

EDUCATION

Georgia Institute of Technology

Ph.D. in Computer Science

2019

Dissertation: "Combinational Machine Learning Creativity"

Ph.D. Committee: Mark Riedl (chair), Ashok Goel, Charles Isbell, Brian Magerko, Michael Mateas, and Devi Parikh

B.S. Computational Media with Honors

2014

Certificate in Social Psychology

PUBLICATIONS

Journals

1. Procedural Content Generation via Machine Learning (PCGML), Adam Summerville, Sam Snodgrass, Matthew Guzdial, Christoffer Holmgård, Amy K. Hoover, Aaron Isaksen, Andy Nealen, and Julian Togelius, IEEE Transactions on Games, pp. 257–270, 2018.

Major Conferences

2. Game Engine Learning from Video, Matthew Guzdial, Boyang Li, and Mark Riedl, International Joint Conference on Artificial Intelligence (IJCAI), Acceptance Rate: 26%, 2017.

Specialized Conferences

3. Player Experience Extraction from Gameplay Video, Zijin Lou, Matthew Guzdial, and Mark Riedl, Artificial Intelligence and Interactive Digital Entertainment (AIIDE), 2018.
4. Automated Game Design via Conceptual Expansion, Matthew Guzdial, and Mark Riedl, Artificial Intelligence and Interactive Digital Entertainment (AIIDE), 2018.
5. Creative Invention Benchmark, Matthew Guzdial, Nicholas Liao, Vishwa Shah, and Mark Riedl, International Conference on Computational Creativity (ICCC), 2018.
6. Evaluating Singleplayer and Multiplayer in Human Computation Games, Kristin Siu, Matthew Guzdial, and Mark Riedl, International Conference on the Foundations of Digital Games (FDG), 2017.
7. Game Level Generation from Gameplay Video, Matthew Guzdial, and Mark Riedl, Artificial Intelligence and Interactive Digital Entertainment (AIIDE), 2016.
8. Learning to Blend Computer Game Levels, Matthew Guzdial, and Mark Riedl, International Conference on Computational Creativity (ICCC), Best Paper Award, 2016.
9. Crowdsourcing Open Interactive Narrative, Matthew Guzdial, Brent Harrison, Boyang Li, and Mark Riedl, International Conference on the Foundations of Digital Games (FDG), 2015.

Short Papers

10. Deep Convolutional Player Modeling on Log and Level Data, Nicholas Liao, Matthew Guzdial, and Mark Riedl, International Conference on the Foundations of Digital Games (FDG), 2017.

Workshop Papers

11. Co-Creative Level Design via Machine Learning, Matthew Guzdial, Nicholas Liao, and Mark Riedl, AIIDE Workshop on Experimental AI in Games (EXAG), 2018.
12. Towards Automated Let's Play Commentary, Matthew Guzdial, Shukan Shah, and Mark Riedl, AIIDE Workshop on Experimental AI in Games (EXAG), 2018.
13. Explainable PCGML via Game Design Patterns, Matthew Guzdial, Joshua Reno, Jonathan Chen, Gillian Smith, and Mark Riedl, AIIDE Workshop on Experimental AI in Games (EXAG), 2018.
14. Combinatorial Creativity for Procedural Content Generation via Machine Learning, Matthew Guzdial, and Mark Riedl, AAAI Workshop on Knowledge Extraction from Games (KEG), 2018.
15. Combinatorial Meta Search, Matthew Guzdial, and Mark Riedl, NIPS Workshop on Machine Learning Creativity and Design (MLCD), 2017.
16. Visual Procedural Content Generation with an Artificial Abstract Artist, Matthew Guzdial, Duri Long, Christopher Cassion, and Abhishek Das, ICCG Workshop on Computational Creativity in Games (CCG), 2017.
17. Learning Player Tailored Content from Observation: Platformer Level Generation from Video Traces using LSTMs, Adam Summerville, Matthew Guzdial, Michael Mateas, and Mark Riedl, AIIDE Workshop on Experimental AI in Games (EXAG), 2017.
18. Deep Static and Dynamic Level Analysis: A Study on Infinite Mario, Matthew Guzdial, Nathan Sturtevant and Boyang Li, AIIDE Workshop on Experimental AI in Games (EXAG), 2016.
19. Toward Game Level Generation from Gameplay Videos, Matthew Guzdial, and Mark Riedl, FDG Workshop on Procedural Content Generation in Games (PCG), 2015.

Other

20. Explainable AI for Designers, Jichen Zhu, Rafael Bidarra, Alex J. Champandard, Simon Colton, Reynald Francois, Matthew Guzdial, Amy K. Hoover, Antonios Liapis, Sebastian Risi, Gillian Smith, Anne Sullivan, and G Michael Youngblood, Dagstuhl Seminar 1747: Artificial and Computational Intelligence in Games: AI-Driven Game Design, 2018.
21. AI As Reflective Practice, Gillian Smith, Mirjam P. Eladhari, Matthew Guzdial, Emily Short, Adam M. Smith, Anne Sullivan, Tommy Thompson, and R Michael Young, Dagstuhl Seminar 1747: Artificial and Computational Intelligence in Games: AI-Driven Game Design, 2018.
22. AI-assisted Board Game Play, Antonios Liapis, Michael Cook, Steve Dahlskog, Mirjam P. Eladhari, Matthew Guzdial, Emily Short, Gillian Smith, Anne Sullivan, and Tommy Thompson, Dagstuhl Seminar 1747: Artificial and Computational Intelligence in Games: AI-Driven Game Design, 2018.
23. What is Machine Learning/Deep Learning, Matthew Guzdial, Joshua A. McCoy, and Jichen Zhu, Dagstuhl Seminar 1747: Artificial and Computational Intelligence in Games: AI-Driven Game Design, 2018.
24. A General Level Design Editor for Co-creative Level Design, Matthew Guzdial, Jonathan Chen, Shao-Yu Chen, and Mark Riedl, Experimental AI in Games Workshop Demonstration, 2017.
25. Machine Learning for Procedural Content Generation, Alexander Zook, Adam Summerville, and Matthew Guzdial, and Amy K. Hoover, Foundations of Digital Games Panel, 2017.
26. An Intelligent Game Level Design Editor Informed by Gameplay Videos, Matthew Guzdial, and Mark Riedl, Experimental AI in Games Workshop Demonstration, 2015.

INVITED TALKS	Unite Los Angeles: Unity Developer Conference (Unite) Using Machine Learning to Enhance Content Production Workflows	2018
	University of Southern California Invited Talk: "Automated Game Generation via Machine Learning"	2018
	Blizzard Invited talk: "Procedural Content Generation via Machine Learning"	2017
HONORS AND AWARDS	Foley Scholar Finalist	2018
	Heidelberg Laureate Forum Young Researcher	2018
	GVU Travel Grant	2018
	Unity Graduate Fellowship	2018
	Dagstuhl Seminar 1747 Participant	2017
	Foley Scholar Finalist	2017
	Best Paper Award, ICCG Conference	2016
	National Science Foundation Graduate Student Fellowship Honorable Mention	2015
	Georgia Tech College of Computing Best Undergraduate Research Award	2013
	Georgia Tech President's Undergraduate Research Award	2013
CONFERENCE / WORKSHOP ORGANIZATION	AAAI Workshop on Knowledge Extraction from Games Chair	2019
	AAAI Workshop on Knowledge Extraction from Games Chair	2018
	FDG Workshop on Procedural Content Generation Local Coordinator	2017
	ICCC Media Chair	2017
	ICCC Workshop on Computational Creativity Chair	2017
	AIIDE Workshop on Experimental AI in Games Local Coordinator	2016
SELECT REVIEWING AND PROGRAM COMMITTEE MEMBERSHIP	Journal of Parallel and Distributed Computing (JPDC), 2018. IEEE Transactions on Games (TOG), 2017-2018. IEEE Transactions on Computational Intelligence and AI in Games (TCIAIG): Special Issue on AI-based and AI-assisted Game Design, 2017. International Joint Conference on Artificial Intelligence (IJCAI), 2018. ACM CHI Conference on Human Factors in Computing Systems (CHI), 2017-2018. ACM Chi Conference on Designing Interactive Systems (DIS), 2018. IEEE Conference on Computational Intelligence and Games (CIG), 2018. International Conference on the Foundations of Digital Games (FDG), 2017-2018. International Conference on Computational Creativity (ICCC), 2017-2018. AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), 2016-2018. AIIDE Experimental AI in Games Workshop (EXAG), 2016-2018. FDG Workshop on Procedural Content Generation (PCG), 2016-2018. IndieCade, Juror Committee, 2014-2017.	
TEACHING	Georgia Institute of Technology	2014-present
	Term	Instructor Effectiveness
	Spring 2018	Machine Learning 4.82 / 5.0
	Summer 2017	Game AI 4.95 / 5.0
	Georgia Institute of Technology	2014-present
	Co-designed new Game AI course, Teaching Assistant, and two-time primary instructor	

Georgia Institute of Technology

2010-2014

Teaching Assistant: Game AI

STUDENTS

Current

Yalini Kumar (CS Undergrad), Georgia Institute of Technology, Co-creative PCGML
Andrew Hoyt (CS Undergrad), Georgia Institute of Technology, AI Level Design Tools
Kenny Scharm (CS Undergrad), Georgia Institute of Technology, Co-creative PCGML
Maxwell Bronstein (CS Undergrad), Georgia Institute of Technology, Co-creative PCGML
Joshua Reno (CS Undergrad), Georgia Institute of Technology, Co-creative PCGML
Zijin Lou (CS Undergrad), Georgia Institute of Technology, Computer Vision, PURA awardee
Shukan Shah (CS Undergrad), Georgia Institute of Technology, AI Game Commentary, PURA awardee
Vishwa Shah (CS Undergrad), Georgia Institute of Technology, Computational Creativity, PURA awardee
Jonathan Chen (CS Undergrad), Georgia Institute of Technology, Co-creative PCGML/Explainable AI

Graduated

Nicholas Liao (CS Undergrad), Georgia Institute of Technology, **2017**
"Deep Convolutional Player Modeling on Log and Level Data"

Shao-Yu Chen (CS Masters), Georgia Institute of Technology, Co-creative PCGML **2016**

PROFESSIONAL EXPERIENCE

Disney Research, Pittsburgh, PA - Research Assistant Intern **May 2016- August 2016**
Applied deep learning to player experience prediction and simulation.

Zynga Inc., Orlando FL - Design Intern **May 2014 - August 2014**
Led weekly bug-fix count across entire team of twenty-six developers.

Zynga Inc., San Francisco, CA - Production Intern **May 2013 - August 2013**
Developed mobile game prototype single-handedly then lead small team in further development.

PRESS

"Video Games Created Using Artificial Intelligence" BBC, September 2018. [link](#)

"Forget dumping games designers for AI turns out it takes two to tango" The Register, September 2018. [link](#)

"This Video Game Made by AI Looks Fun as Hell" Motherboard, September 2018. [link](#)

"An A.I. is designing retro video games and they're surprisingly good" Digital Trends, September 2018. [link](#)

"AI learns to re-create Super Mario Bros by watching someone else play it" The Verge, September 2017. [link](#)

"Artificial Intelligence is Learning To Develop Games" Rolling Stone, September 2017. [link](#)

"AI System Accurately Replicates Video Games Just by Watching Them" The Seeker, September 2017. [link](#)

"New AI can 'clone' the basic software that brings a video game to life after watching the original for just TWO MINUTES" Daily Mail, September 2017. [link](#)

"Has a Black Mirror episode predicted the future of video games?" The Guardian, October 2016. [link](#)

“Underwater Castle? This AI Creates Never-Before-Seen ‘Super Mario Bros.’ Level” Motherboard, March 2016. [link](#)

“How Computers Learned to Play Mario” Smithsonian Magazine, November 2015. [link](#)

“Algorithm Turns Fiction into Interactive Games” Popular Science, September 2015. [link](#)

“This AI Creates Interactive Fiction by Reading Other People’s Stories” Motherboard, September 2015. [link](#)

“This AI Builds Super Mario Levels by Watching YouTube” WIRED, June 2015. [link](#)

REFERENCES

Mark Riedl (PhD Supervisor), Georgia Institute of Technology, riedl@cc.gatech.edu

Charles Isbell, Georgia Institute of Technology, isbell@cc.gatech.edu

Nathan Sturtevant, University of Alberta, nathanst@ualberta.ca

Jessica Hodgins, Carnegie Mellon University, jkh@cs.cmu.edu

Michael Mateas, University of California, Santa Cruz, michaelm@soe.ucsc.edu