Aline Normoyle, PhD

anormoyle@brynmawr.edu
github.com/alinen
alinen.net

January 22, 2025

Education

University of Pennsylvania
Ph.D. Computer Science 2009-2015
M. Eng. Computer Graphics and Game Technology 2009

McGill University
B.Sc. Honors Computer Science, Dean's Honor List 1999

Employment History

Academic Employment and Internships
Bryn Mawr College, Assistant Professor 2020-Current
Swarthmore College, Visiting Assistant Professor 2017-2020
Clemson University, Engineering Consultant 2017-2018
Recurse Center, Sabbatical Residency 2016
Robotics Institute, Carnegie Mellon University, Research Assistant 2011-2012
Disney Research, Imagineer Summer 2011

Professional Employment
Savvy Sine LLC, Sole Proprietor 2018-Current
Venturi Labs LLC, Director of Software Development 2017-2020
Moon Collider Ltd, AI Programmer and Researcher 2015-2016
SIG Center for Computer Graphics, University of Pennsylvania, Associate Director 2012-2013
Ackoff Collaboratory for Advancement of the Systems Approach (ACASA),
University of Pennsylvania, Sr. Programmer/Analyst 2006-2008
MAK Technologies, Sr. Software Engineer 1999-2006

Publications

Peer-Reviewed Papers and Posters

Ngaw, Britney, Grishma Jena, João Sedoc, and Aline Normoyle. "Towards Authoring Open-Ended Behaviors for Narrative Puzzle Games with Large Language Model Support". In: *Proceedings of the 19th International Conference on the Foundations of Digital Games*. 2024, pp. 1–4. DOI: 10.1145/3649921.3656975.

Normoyle, Aline, Sophie Jörg, and Jennifer Hill. "The Curation Tree: A Lightweight Behavior Tree Framework for Implementing Puzzle and Narrative Games". In: *Proceedings of the 19th International Conference on the Foundations of Digital Games*. 2024, pp. 1–4. DOI: 10.1145/3649921.3659840.

Normoyle, Aline, João Sedoc, and Funda Durupinar. "Using LLMs to Animate Interactive Story Characters with Emotions and Personality". In: *2024 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*. IEEE. 2024, pp. 632–635. DOI: 10.1109/VRW62533.2024.00124.

Normoyle, Aline, Neha Thumu, and Yi Fei Cheng. "Controller influence on self-determination versus performance in a mobile augmented reality platform game". In: *Proceedings of the 17th ACM SIGGRAPH Conference on Motion, Interaction, and Games*. MIG '24. Arlington, VA, USA: Association for Computing Machinery, 2024. ISBN: 9798400710902. DOI: https://doi.org/10.1145/3677388.3696332. URL: https://doi.org/10.1145/3677388.3696332.

Adkins, Alex, Aline Normoyle, Lorraine Lin, Yu Sun, Yuting Ye, Massimiliano Di Luca, and Sophie Joerg. "How important are detailed hand motions for communication for a virtual character through the lens of charades?" In: *ACM Transactions on Graphics* 42.3 (2023), pp. 1–16. DOI: 10.1145/3578575.

Thumu, Neha, Faith Meacham, and Aline Normoyle. "Towards Understanding the Role of Curiosity in Puzzle Design". In: *Companion Proceedings of the Annual Symposium on Computer-Human Interaction in Play*. 2023, pp. 17–21. DOI: 10.1145/3573382.3616070.

Adkins, Alex, Lorraine Lin, Aline Normoyle, Ryan Canales, Yuting Ye, and Sophie Jörg. "Evaluating grasping visualizations and control modes in a vr game". In: *ACM Transactions on Applied Perception (TAP)* 18.4 (2021), pp. 1–14. DOI: 10.1145/3486582.

Mainardi, Guido, Aline Normoyle, Vinıcius Cassol, Norman Badler, and Soraia Raupp Musse. "An authoring tool to provide group and crowd animation using natural language scripts". In: *2021 20th Brazilian Symposium on Computer Games and Digital Entertainment (SBGames)*. IEEE. 2021, pp. 153–161. DOI: 10.1109/SBGames54170.2021.00027.

Canales, Ryan, Aline Normoyle, Yu Sun, Yuting Ye, Massimiliano Di Luca, and Sophie Jörg. "Virtual grasping feedback and virtual hand ownership". In: *ACM Symposium on Applied Perception 2019*. 2019, pp. 1–9. DOI: 10.1145/3343036.3343132.

Chow, Kristin, Aline Normoyle, Jeanette Nicewinter, Clark L Erickson, and Norman I Badler. "Crowd and procession hypothesis testing for large-scale archaeological sites". In: *MARCH Workshop, 2019 IEEE International Conference on Artificial Intelligence and Virtual Reality (AIVR)*. IEEE. 2019, pp. 298–2983. DOI: 10.1109/AIVR46125.2019.00069.

Lin, Lorraine, Aline Normoyle, Alexandra Adkins, Yu Sun, Andrew Robb, Yuting Ye, Massimiliano Di Luca, and Sophie Jörg. "The effect of hand size and interaction modality on the virtual hand illusion". In: *2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*. IEEE. 2019, pp. 510–518. DOI: 10.1109/VR.2019.8797787.

Normoyle, Aline and Yifei Cheng. "The Q* bird Level Designer: User-assisted procedural level design in augmented reality". In: *Proceedings of the 12th ACM SIGGRAPH Conference on Motion, Interaction and Games*. 2019, pp. 1–2. DOI: 10.1145/3359566.3364686.

Normoyle, Aline and Sophie Jörg. "The effect of animation controller and avatar on player perceptions". In: *Computer Animation and Virtual Worlds* 29.6 (2018). DOI: 10.1002/cav.1731.

Normoyle, Aline and Shane Jensen. "Bayesian clustering of player styles for multiplayer games". In: *Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment*. Vol. 11. 1. 2015, pp. 163–169. DOI: 10.1609/aiide.v11i1.12805.

Normoyle, Aline and Norman I Badler. "How do stylistic motions differ numerically from neutral ones?" In: *Proceedings of the 7th International Conference on Motion in Games*. 2014, pp. 184–184. DOI: 10.1145/2668064.2677080.

Normoyle, Aline, Gina Guerrero, and Sophie Jörg. "Player perception of delays and jitter in character responsiveness". In: *Proceedings of the ACM symposium on applied perception*. 2014, pp. 117–124. DOI: :10.1145/2628257.2628263.

Normoyle, Aline and Sophie Jörg. "Trade-offs between responsiveness and naturalness for player characters". In: *Proceedings of the 7th International Conference on Motion in Games*. 2014, pp. 61–70. DOI: 10.1145/2668064.2668087.

Normoyle, Aline, Maxim Likhachev, and Alla Safonova. "Stochastic activity authoring with direct user control". In: *Proceedings of the 18th Meeting of the ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games*. 2014, pp. 31–38. DOI: 10.1145/2556700.2556714.

Normoyle, Aline, Jeremy B Badler, Teresa Fan, Norman I Badler, Vinicius J Cassol, and Soraia R Musse. "Evaluating perceived trust from procedurally animated gaze". In: *Proceedings of Motion on Games*. 2013, pp. 141–148. DOI: 10.1145/2522628.2522630.

Normoyle, Aline, Fannie Liu, Mubbasir Kapadia, Norman I Badler, and Sophie Jörg. "The effect of posture and dynamics on the perception of emotion". In: *Proceedings of the ACM symposium on applied perception (best student presentation)*. 2013, pp. 91–98. DOI: 10.1145/2492494.2492500.

Jörg, Sophie, Aline Normoyle, and Alla Safonova. "How responsiveness affects players' perception in digital games". In: *Proceedings of the ACM symposium on applied perception*. 2012, pp. 33–38. DOI: 10.1145/2338676.2338683.

Normoyle, Aline, John Drake, Maxim Likhachev, and Alla Safonova. "Game-based data capture for player metrics". In: *Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment*. Vol. 8. 1. 2012, pp. 44–50. DOI: 10.1609/aiide.v8i1.12508.

Zhao, Liming, Aline Normoyle, Sanjeev Khanna, and Alla Safonova. "Automatic construction of a minimum size motion graph". In: *Proceedings of the 2009 ACM SIGGRAPH/Eurographics symposium on Computer animation*. 2009, pp. 27–35. DOI: 10.1145/1599470.1599474.

Knight, Kevin M, Deepthi Chandrasekaran, Aline Normoyle, Ransom Weaver, and Barry G Silverman. "Transgression and atonement". In: *International Workshop on Coordination, Organizations, Institutions, and Norms in Agent Systems (COIN'08)*. Springer Berlin Heidelberg Berlin, Heidelberg. 2008, pp. 250–265. DOI: 10.5555/3000392.3000414.

Silverman, Barry G, Aline Normoyle, Praveen Kannan, Richard Pater, Deepthi Chandrasekaran, and Gnana Bharathy. "An embeddable testbed for insurgent and terrorist agent theories: InsurgiSim". In: *Intelligent Decision Technologies* 2.4 (2008), pp. 193–203. DOI: 10.5555/1515884.1515885.

Summers, V, Aline Normoyle, and Robert Flo. "Increasing situational awareness by combining realistic and non-realistic rendering techniques". In: *Proceedings of the 10th International Command and Control Research and Technology Symposium*. Accession Number: ADA463760. 2005.

Technical reports, working papers, posters, and talks

Senghas, Ann, Aline Normoyle, Naomi Caselli, Corrine Occhino, and Matthew W. G. Dye. "Measuring changes in Nicaraguan signing using skeletal modeling with analog 2D video sources". In: *15th International Conference on Theoretical Issues in Sign Language Research (TISLR 15)*. Poster. 2025.

The effects of inaccurate body language on 3D digital self-expression. Invited Talk, Bamberg University, Bamberg, Germany. 2023.

How avatar grasping affects perceived body ownership and performance in virtual reality. Invited Talk, CIMAT, Guanajuato, Mexico. 2022.

Normoyle, Aline, Bruno Artacho, Andreas Savakis, Ann Senghas, Norman I. Badler, Corrine Occhino, Samuel J. Rothstein, and Matthew W. G. Dye. "Open-Source Pipeline for Skeletal Modeling of Sign Language Utterances

from 2D Video Sources". In: *14th International Conference on Theoretical Issues in Sign Language Research (TISLR 14)*. Talk. 2022.

Normoyle A., Zhang E. and Badler N. I. "Open-body-fit: open-source resources for estimating biomechanically-motivated metrics from video". In: *ACM SIGGRAPH Motion, Interaction, and Games (MIG '22)*. Poster. 2022.

Normoyle, Aline and Shane T Jensen. "Bayesian learning of play styles in multiplayer video games". In: *arXiv preprint arXiv:2112.07437* (2021).

Normoyle A., Rothstein S. J. and Badler N. I. "Quantifying sign-language movement kinematics from video". In: *ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (i3D '21)*. Poster. 2021.

Lane, Stephen H. and Aline Normoyle. *Civic Portal: Virtual Monuments*. Fast Forward Philly. 2018.

Procedural Art Pop-up. Recurse Center, Hosted by the School of Machines, Making, and Make Believe, Berlin. 2017.

Sedoc, João and Aline Normoyle. "Seating Assignment Using Constrained Signed Spectral Clustering". In: *arXiv preprint arXiv:1708.00898* (2017).

Sunshine-Hill, B. and A. Normoyle. *How to use machine learning like a responsible adult*. AI Summit, Game Developer Conference. 2015.

Normoyle, Aline, John Drake, and Alla Safonova. "Egress online: towards leveraging massively, multiplayer environments for evacuation studies". In: *whitepaper* (2012).

Patents

Lane, Stephen H, Matthew Anthony Boyd-Surka, Yaoyi Bai, and Aline Sarah Normoyle. *Methods, systems, and computer readable media for extended reality user interface*. US Patent 11,893,696, U.S. Patent Application 17/412,197. 2024.

Grants and Awards Received

1. Bryn Mawr College Digital Scholarship Grant, 2023-2024, "Game-based experiment platform development"
2. National Science Foundation, 2019-2022, "Collaborative Research: Multimethod Investigation of Articulatory and Perceptual Constraints on Natural Language Evolution" (Award 1749397)
3. Swarthmore Faculty Research Support Award, 2018-2019, "Game-based experiment platform development"
4. Wharton Customer Analytics Initiative, 2014, "Discovery of Latent Play Styles for Improved Game Matching and Prediction"
5. Best paper award for "Trade-offs between Responsiveness and Naturalness for Player Characters", ACM SIGGRAPH conference in Motion in Games, 2014
6. Best student presentation for "The Effect of Posture and Dynamics on the Perception of Emotion", ACM Symposium on Applied Perception, 2013
7. Teaching practicum award, University of Pennsylvania, 2010

Teaching

Bryn Mawr College, Assistant Professor

CS 399: Senior Conference	Spring 2022
CS 355: Operating Systems	spring 2025
CS 317: Computer Animation	Fall 2021
CS 312: Computer Graphics	Spring 2023, Spring 2021
CS 283: Game Programming	Fall 2024
CS 231: Discrete Math	Fall 2021
CS 223: Systems Programming	S25, F24, S23, F22, S22
CS 113: Introduction to Computer Science	Fall 2022, Spring 2021
CS 110: Introduction to Computing	Fall 2020

Swarthmore College, Visiting Assistant Professor

CS 71: Software Engineering	Spring 2019
CS 21: Introduction to Computer Science	Fall 2018, Spring 2020
CS 56/91: Computer Animation	Spring 2018, Spring 2017, Fall 2019

University of Pennsylvania, Co-Instructor

CIS 497: Senior capstone project	2014-2015

University of Pennsylvania, Student Instructor

CIS 563: Physically-based Animation	Spring 2011

University of Pennsylvania, Teaching Assistant

Winner of the University of Pennsylvania Teaching Practicum Award

CIS 563: Physically-based Animation	Spring 2010
CIS 660: Advanced Graphics	Spring 2010, 2011
CIS (EAS) 499: Senior Capstone Project	2010-2011

Academic Service

Institutional Service

Chemistry Hiring Commitee	2024
Committee on Libraries, Information and Computing (CLIC)	2024-2027
Faculty Contact for the University of Pennsylvania Accelerated Master's Program (4+1)	2023-Current
Institutional Review Board, Bryn Mawr College	2021-Current
Playing House: A seminar featuring Mark Z. Danielewski	Spring 2024
Collaborated with primary organizer, Jose Vergara	
Panel discussion: Literature, game design, and storytelling	
Canaday Library Exhibit Setup (One week)	
PEW Grant: Retrospective of Annie Dorsen's Algorithmic Theater	Spring 2023
Collaborated with primary organizer, Linda Caruso Haviland	
Host for LaJuné McmIllian Visit	
Organizer for Chatbot Improv event	
STEM Posse Summer Workshop, Bryn Mawr College	2022-2024
STEMLA Summer Workshop, Bryn Mawr College	2023-2024
STEMLA Summer Academic Fair, Bryn Mawr College	August 2021, 2022
Computer Graphics Honors Examiner, Swarthmore College	Spring 2021
Career Services and Job Events, Swarthmore College Computer Science Department	2018-2020
Judge, SisterHacks, Bryn Mawr College	2018-2019
Society of Women Gears Worskhop Leader, University of Pennsylvania	2011-2013

Academic Conference Organization

IEEE VR Workshop on Multi-modal Affective and Social Behavior Analysis and Synthesis in Extended Reality (MASSXR)	2024-2025
ACM SIGGRAPH Conference in Motion, Interaction and Games (MIG), Program Co-chair	2022

Academic Program Committees and Editorships

ACM SIGGRAPH, General Submission Juror	2024
International Conference on Interactive Media, Smart Systems and Emerging Technologies (IMET)	2023
IEEE VR 2023 Workshop: MASSXR-Multi-modal Affective & Social Behavior Analysis and Synthesis in Extended Reality (MASSXR)	2023
International Conference on Computer Animation and Social Agents (CASA)	2023, 2025
Computers & Graphics: Special Section on Motion, Interaction and Games (MIG)	2022
Graphics Interfaces (GI)	2022-2023
ACM Conference on Intelligent Virtual Agents (IVA)	2015-2024
AAAI Conference on Artificial Intelligence in Interactive Digital Entertainment (AIIDE)	2016-2024
ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (i3D)	2018-2022, 2024
ACM SIGGRAPH Conference in Motion, Interaction and Games (MIG)	2011-2018,2022-2024

Additional Reviewing (Journals and Books)

Computer Graphics and Applications	2023
ACM Transactions on Applied Perception	2022
ACM SIGGRAPH Tertiary Reviewer	2019
GPU Zen 2	2018
webGL Insights	2014

Academic Software

1. AGL: A Graphics Library. *Small, easy to use C++ library for 3D drawing, based on openGL.*, 2021
   https://github.com/alinen/agl
2. ATK: Animation Toolkit. *C++ character animation library.*, 2021
   https://github.com/alinen/atk
3. open-body-fit *Open-source resources for estimating biomechanically-motivated metrics from video.*, 2022
   https://github.com/alinen/open-body-fit

Advising

Bryn Mawr College Thesis

Abigail Marmer-Adams, Spring 2024, *RPG Navigation, Path Planning, and Sprite Animation*

Ary Wilson, Spring 2024, *Stroke and Filter-Based NPR using XDoG and Flow Charts*

Audrey Wang, Spring 2024, *Decision-Making Agents in the Context of Simulation Games*

Synarah Sitaf, Spring 2024, *Modeling Objects With Signed Distance Functions*

Foqia Shahid, Spring 2023, *Body Transfer in Animal Avatars: An Investigation of Virtual Reality Control Mapping Strategies*

Judy Wang, Spring 2023, *Investigating Body Ownership in Animal Avatars through Virtual Reality*

Jasmine Lei, Spring 2023, *Visuaizing Chaotic Systems*

Alec Mazzoli, Spring 2022, *The Impact of Agent Performance on Human-Agent Conversational Error Analysis*

Haiqa Kamran, Spring 2022, *Charitably: An Aggregator Web Application for Charity Causes and Events*

Sarah Coufal, Spring 2022, *Embodiment from Video*

William Lawrence, Spring 2022, *Automatic Placement of Cultural Objects Within a Simulated Archaeological Environment*

Faryal Khan, Spring 2022, *Scripting Crowd Behaviors in SPACES*

Faith Meacham, Spring 2021, *Procedural Level Generation for Monument Valley Styled Puzzle Games*

Jocelyn Dunkley, Spring 2020, *VR Orchestra App: Violin Prototype*

Linda Zhu, Spring 2020, *InstructAR: Building a Deliverable Infrastructure of How-to Kits for Assembly Scenarios in Augmented Reality*

Haverford College Thesis

Gavin Sears, Fall 2024, *Co-Speech Gestures: Theory and Generation*

Joel Torres, Fall 2023, *Facilitating Emotional Wellness Through Virtual Reality*

Neha Thumu, Fall 2023, *Procedural Content Generation for Puzzles*

David Dinh, Fall 2022, *Parallel Computation: Simulating Smoke on the GPU*

Macintyre Sunde, Spring 2022-Fall 2022, *hape Grammars for Architectural Reconstruction*

Olga Shevchuk, Fall 2021-Spring 2022, *Skinning of Characters with Polygonal Mesh*

Ziyao Wang, Fall 2021, *Artistic Hair Modeling*

Yuxiao Wang, Fall 2020, *Literature Review: Embodied Conversational Agents*

Independent Study

Yue Chen, Paprika Chen, Joon Luther, Kylie McCombs, Gavin Sears, Neha Thumu, Fall 2024, *HyperReal Theater*

Neha Thumu, Spring 2023, *Control Strategies for Mobile Augmented Reality*

Neha Thumu, Fall 2022, *Motion and navigation planning for digital characters*

Samuel J. Rothstein, Spring 2020, *Procedural generation of body language*

Michael Piazza, Spring 2017, *Topics in Procedural Animation*

Research students

Zachary Tenn Yuk, Summer 2024, University of Florida REU, *EduToon: Generating comic book summaries for academic papers.*

Neha Thumu, Summer 2022, Bryn Mawr Summer Science Researcher (SSR), *Understanding how character control and level design affect the player experience in video games*

Edward Zhang, Summer 2022, University of Pennsylvania REU, *Collaborative Research: Multimethod Investigation of Articulatory and Perceptual Constraints on Natural Language Evolution.*

Gulesh Shukla, Spring 2022, Bryn Mawr RA, *Analysis of motion from video*

Lola Rodgrigues, Fall 2021, Bryn Mawr RA, *Peg Board Task Game*

Samuel J. Rothstein, Summer 2020, University of Pennsylvania REU, *Collaborative Research: Multimethod Investigation of Articulatory and Perceptual Constraints on Natural Language Evolution.*

Felicity Yick and Samantha Lee, Summer 2020, University of Pennsylvania Summer Research, *SPACES Project: Recreating the ancient city of Pachacamac.*

Katherine Lima, Summer 2019, Swarthmore Summer Researcher, *Role Player Game (RPG) Development for Artificial Intelligence Testbed*

Yi Fei Cheng, Summer 2019, Swarthmore Summer Researcher, *The Q*Bird Level Designer: User-assisted procedural Level Design in Augmented Reality*

Mirabai Smoot and Nana Anikuabe, Summer 2019, Swarthmore Summer Researcher, *Adaptive Bayesian learning of Playstyles*

Effie Li, Summer 2019, University of Pennsylvania REU, *Collaborative Research: Multimethod Investigation of Articulatory and Perceptual Constraints on Natural Language Evolution.*

Kristin Chow, Summer 2019, University of Pennsylvania Summer Researcher, *SPACES Project: Recreating the ancient city of Pachacamac.*

Xuan Huang, Spring 2017, Bryn Mawr College, *Procedural Generation of Cities*

Mentorship and Support

Chandini Ragobar, Summer 2023, Haverford College, Chesick Summer Experience Funding

Swarthmore CPSC 000SR, Spring 2019, Student instructor: Aaron Kang, *Introduction to Unity*