Aline Normoyle, PhD

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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

Research Experience

Recurse Center
New York, NY, Sabbatical, 2016

Developed game and graphics demos in webGL/Javascript, OpenGL ES/Android, and openCV. Rebuilt website using Python Flask, SQLAlchemy, and Jinja. Mentored for openGL and aided follow recursers in creating their own first ray tracers.

University of Pennsylvania
Philadelphia, PA, Visiting Research Scholar, 2016

Advised students in developing a large, activity rich crowd for a simulaton of Reading Terminal Market.

Wharton Consumer Analytics Initiative (WCAI)
Philadelphia, PA, Researcher, 2015

Won proposal for "Discovery of Latent Play Styles for Improved Game Matching and Prediction" to develop and evaluate a novel clustering algorithm for player-vs-player match logs of Battlefield 3 players.

Robotics Institute, Carnegie Mellon University
Pittsburgh, PA, Research Assistant, 2011-2012

Researched algorithms for efficiently collecting data using games within an online, multiplayer environment; user perception of game controllers; and algorithms for animating crowds.

Disney Research
Pittsburgh, PA, Imagineering Intern, 2011

Researched and developed an animation system for automatically generating character responses dynamically. For a given character (possibly robotic or virtual), the resulting system generated smooth, collision-free transitions between performance animations and response animations.

Professional Experience

Independent contractor
Animation, graphics, and Game consultant and programmer, 2016 - Current

Design and implemention of games and simulations for teaching and training. Consulting for capturing and processing motion capture data for animating virtual characters. Current clients include the New York University Humanities and Social science department where we are creating a Unity game to teach causal statistics.

Moon Collider, Ltd
Edinburgh, UK, AI Programmer and Researcher, 2015-2016

Researched and implemented navigation, ing, and decision-making algorithms for Kythera, Moon Collider's highly scalable, game AI middleware. Implemented ORCA-based 2D avoidance algorithms used in the indie hack-n-slash *Wolcen: Lords of Mayhem* and the survival sandbox zombie game, *Miscreated*. Scripted NPCs with behavior trees for *Aquanox: Deep Descent*.

SIG Center, University of Pennsylvania

Philadelphia, PA, Associate Director, 2012-2013

Managed the computer graphics facilities for all PhD, CGGT, and DMD students (100+ students). Maintained and managed the motion capture facilities and supervised capture sessions and data cleanup. Mentored 20+ undergraduate projects, ran workshops and lab tours for K-12 outreach in science and engineering. Setup, maintained, and provided training for various lab software and hardware, such as our VICON motion capture system (with forceplate, sole pressure sensors and eye tracker integration), renderfarm, backup storage systems, SVN repository, graphics cards, and development environments (openCV, QT, Unity, Maya, Nexus, etc)

ACASA, University of Pennsylvania

Philadelphia, PA, Sr. Programmer/Analyst, 2006-2008

NonKin Village

Managed, designed, and developed the simulation of a fictional Iraqi town (100+ residents) for a counter insurgency training game; built narrative authoring tools and interactive 2D map framework; wrote budget and scheduling plans, technical proposals; and presented projects to contract sponsors.

PMFServ

Overhauled software framework for designing and testing agents: Improved performance 90+%; Designed new "Agile Agent Architecture" and implemented new plugin framework; Streamlined GUI; Ported social models to framework.

InsurgiSim and CrowdSim

Managed and mentored student teams for insurgent simulation projects; Integrated student work with JSAF and spearheaded the final, stable executables.

MAK Technologies

Cambridge, MA, Senior Software Engineer, 1999-2006

Senior developer for applications, utilities, toolkits, and demos for distributed simulation tools. Developed over five new applications and APIs (contributing to six out of ten of MAK's 2006 product suite); developed internal applications for license management and demo creation; worked daily to solve customer problems; wrote documentation and training materials; demoed software at over 15 tradeshows and workshops, and released over 30 product distributions.

Stealth/vpNet Lead Engineer, 2002 - 2006

Designed and developed the MAK Stealth 6.0 series framework, GUI, and associated APIs (800+ classes, 12+ third party dependencies, and supporting features such as sound, joystick, effects, remote control, and custom model memory paging). Between 2002 and 2005, Stealth sales doubled due to improvements in the tool. Aided project scheduling and management.

Designed and developed the StealthXR 1.0 series, an exaggerated reality visualizer for distributed simulation; Implemented features for the non-photorealistic rendering of entities and terrains as well as exaggerated non-perspective views to produce a god's eye overview of a battlefield. In 2005, Stealth sales rose 34% from 2004, 25% of which were due to StealthXR sales.

Worked with company partners in developing sister products and plug-ins; Helped resolve integration problems and setup demos, for example, with Joint Forces Command's (JFCOM) 2005 I/ITSEC Joint Virtual Training Special Event (JVTSE), which consisted of over 50+ participants, 1000+ entities, and 5Gb terrain playing together in a virtual environment

VR-Forces Remote Control API 2002

Designed and implemented version 1.0 of the network interface between a computer generated forces (CGF) simulator and front-end plan view display; Implemented TCP/IP,UDP socket communication and packet protocols; Designed API to abstract implementation details from users.

RTI-Spy 2001 - 2002

Designed and developed version 1.0 of the RTI Spy API and RTI Spy Console. In 2002, RTI Spy sales helped contribute to nearly half of all RTI sales.

VR-Link 2000 - 2002
Implemented DIS/HLA protocols; Participated in SISO meetings during the design on the RPR FOM 1.0/2.0 standards.

Teaching Experience

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

Skills

- Data analysis and modeling, linear algebra, geometry, discrete mathematics, optimization, graphics
- Programming (C++, C, C#, Python, Java, Matlab, OOP)
- Graphics and physics programming (OpenGL, CUDA, GLSL, OpenCV, Unity, Unreal Engine)
- 3D Modeling and graphics (Maya, Blender, GIMP, Inkscape, MotionBuilder, Plugin APIs)
- Optical motion capture and data processesing (Nexus, MotionBuilder, C3D, FBX, BVH, AMC/ASF)
- Data manipulation (Scripting, Excel, XML, R, Matlab, Python Jupyter, Matplotlib)
- Web programming and databases (webGL, HTML/CSS, Javascript, PHP, MySQL, SqlAlchemy, Flask)
- Mobile programming (Android, OpenGL ES)
- Software IDEs (Git, SVN, Makefiles, MSDev)

Publications

Normoyle, A., Joerg, S. "The effect of animation controller and avatar on player perceptions", Computer Animation and Virtual Worlds, 2016 (to appear)

Normoyle, A., Jensen, S. T., "Discovery of Latent Play Styles for Improved Game Matching and Prediction", AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment, 2015.

Normoyle, A., Joerg, S. "Trade-offs between Responsiveness and Naturalness for Player Characters", ACM SIGGRAPH conference in Motion in Games, 2014 (won best paper)

Normoyle, A., Guerrero, G., Joerg, S., "Player perception of delays and jitter in character responsiveness", ACM Symposium on Applied Perception, 2014

Normoyle, A., Likhachev M., Safonova A., "Stochastic activity authoring with direct user control", ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games, 2014

Normoyle, A., Badler, J., Fan T., Badler, N.I., Cassol, V., Musse, S., "Evaluating perceived trust from procedurally animated gaze", ACM SIGGRAPH conference in Motion in Games, 2013

Normoyle, A., Liu, F., Kapadia, M., Badler, N.I., Joerg, S., "The Effect of Posture and Dynamics on the Perception of Emotion", ACM Symposium on Applied Perception, 2013 (won best student presentation)

Normoyle, A., Drake, J., Likhachev, M., Safonova, A., "Game-based Data Capture for Player Metrics" AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment, 2012.

Joerg, S., Normoyle, A., Safonova, A., "How Responsiveness Affects Players' Perception in Digital Games" ACM Symposium on Applied Perception, 2012.

Zhao, L., Normoyle, A., Khanna, S., Safonova, A., "Automatic Construction of a Minimum Size Motion Graph" ACM SIGGRAPH/Eurographics Symposium on Computer Animation, 2009.

Silverman, B.G., Normoyle A., Kannan P., Pater R., Chandrasekaran, D., Bharathy G., "An embeddable testbed for insurgent and terrorist agent theories: InsurgiSim" Intelligent Decision Technologies, Volume 2 Issue 4, 2008, 193-203

Knight, K.M., Chandrasekaran, D., Normoyle, A., Weaver, R., Silverman, B.G., "Modeling Transgressions in PMFserv" AAAI-08 COIN Workshop

Summers, V.A., Normoyle, A., Flo R., "Increasing Situational Awareness by Combining Realistic and Non-Realistic Rendering Techniques" 10th International Command and Control Research and Technology Symposium 2005

Technical reports, posters, and talks

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

Normoyle, A., Badler N. I., "How do stylistic motions differ numerically from neutral ones?", ACM SIGGRAPH conference in Motion in Games, 2014

Normoyle, A., Drake, J., Safonova, A., "Egress Online: Towards leveraging massively, multiplayer environments for evacuation studies", University of Pennsylvania Department of Computer and Information Science Technical Report No. MS-CIS-12-15. 2012