Nicholas Sohre

https://www-users.cs.umn.edu/~sohre007/ 1310 Sherburne Ave St Paul, MN 55104 sohre@cs.umn.edu

Research Interests

Using data-driven and simulation-based methods to enhance Artificial Intelligence, Machine Learning, Realtime Graphics, and Virtual Reality.

Education

University of Minnesota 2014 – Present
Ph.D. Student Advisor: Stephen J. Guy
GPA: 4.0

University of Minnesota 2014 – 2017
Master of Science Graduated
GPA: 4.0

Dordt College 2007 – 2011
Bachelor of Arts in Computer Science Graduated
GPA: 3.9

Selected Publications

Journal Publications

1. **Crowd Space: Predictive Crowd Analysis using Manifold Learning**
Ioannis Karamouzas, Nick Sohre, and Stephen J. Guy, and Sofia Lyford-Pike. Under submission to Transactions on Graphics/SIGGRAPH 2018

2. **Dynamic Properties of Successful Smiles**
Nathaniel E Helwig, Nick E. Sohre, Mark R. Ruprecht, Stephen J. Guy, and Sofia Lyford-Pike. "Dynamic properties of successful smiles." PloS one 12, no. 6 (2017): e0179708.

3. **Implicit Crowds: Optimization Integrator for Robust Crowd Simulation**
Ioannis Karamouzas, Nick Sohre, and Stephen J. Guy. "Implicit Crowds: Optimization Integrator for Robust Crowd Simulation" ACM Transactions on Graphics (Proceedings of SIGGRAPH 2017).

Conference Papers

4. **PVL: A Framework for Navigating the Precision-Variety Trade-off in Automated Animation of Smiles**
Nick Sohre, Moses Adeagbo, Nathaniel Helwig, Sofia Lyford-Pike, and Stephen J. Guy. "PVL: A Framework for Navigating the Precision-Variety Trade-off in Automated Animation of Smiles." Accepted Technical Paper to appear in AAAI 2018.

5. **Data-Driven Sokoban Puzzle Generation with Monte Carlo Tree Search (Best Student Paper)**
Bilal Kartal, Nick Sohre, and Stephen J. Guy. "Data-Driven Sokoban Puzzle Generation with Monte Carlo Tree Search." Twelfth Artificial Intelligence and Interactive Digital Entertainment Conference. 2016.

Workshops & Posters

6. **Evaluating Collision Avoidance Effects on Discomfort in Virtual Environments**
Nick Sohre, Charlie Mackin, Victoria Interrante, and Stephen J. Guy. "Evaluating collision avoidance effects on discomfort in virtual environments." In Virtual Humans and Crowds for Immersive Environments (VHCIE), 2017 IEEE, pp. 1-5. IEEE, 2017.

7. **A Data-Driven Method for Variation in Animated Smiles (Best Poster)**
Nick Sohre, Stephen J Guy "A Data-Driven Method for Variation in Animated Smiles" (Poster) Motion in Games 2016

Research Experience

University of Minnesota — Research Assistant
Minneapolis, MN — August 2016 – Present

Applied deep learning to local-global path planning and navigation tasks. Used simulation techniques to develop new methods for motion planning under uncertainty.
Applied machine learning and data-driven analyses to approach generative tasks including animation and puzzle configurations

University of Minnesota — Research Assistant
Minneapolis, MN — June 2016 – August 2016

Designed and developed a user study app to collect data on smile effectiveness of patients after facial reconstructive surgery.
Performed unsupervised clustering on brain scan data to discover biotypes for high risk and Autism positive toddlers.

University of Minnesota — Research Assistant
Minneapolis, MN — June 2015 – August 2015

Designed and developed a user study app to collect data on emotional intent of digital facial expressions. Conducted large scale user study and data analysis.
Designed and developed a system to explore kernel methods for classification tasks in the microbiome

Professional Experience

iBusiness Solutions, Inc — Lead Applications Designer
Edina, MN — August 2011 - August 2014

Responsible for designing, architecting, and implementing business intelligence applications. Included development of the *iBLeague,* a web-based business intelligence platform, and a large data warehouse with naïve-bayes classifier for the MN Department of Education

Dordt College — Webmaster
Sioux Center, IA
Developed and maintained college-wide external, internal, and departmental websites

Qualifications

Programming Languages Java, C,C++,C#, PHP, Python, Matlab, R, Web stack (Javascript, HTML, CSS, etc), OpenGL stack (OpenGL/GLSL, SDL,GLEW)

Libraries & Tools: TensorFlow, Keras, Unity Game Engine, Visual Studio, IntelliJ, Eclipse

Operating Systems: Windows, Linux

Databases: MS SQL, MySQL, SSAS

Awards & Honors

Graduate AIIDE 2016 Best Student Paper, MiG 2016 Runner-up Best Poster

Undergraduate DC Presidential Scholarship, Distinguished Scholarship, JJR Leadership Activity Scholarship, Vermeer Computer Science Intern Scholarship, Academic Competitive Grant

References available upon request.