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|------------------------------|---|---|
| <b>Research Interests</b>    | Using data-driven methods to enhance modern AI techniques   |   |
| <b>Education</b>             | <b>University of Minnesota</b><br>Ph.D. Student<br>GPA: 4.0   | 2014 – Present<br>Advisor: Stephen J. Guy         |
|                              | <b>University of Minnesota</b><br>Master of Science<br>GPA: 4.0   | 2014 – 2017<br>Graduated                          |
|                              | <b>Dordt College</b><br>Bachelor of Arts in Computer Science<br>GPA: 3.9  |   |
| <b>Selected Publications</b> | <b>Implicit Crowds: Optimization Integrator for Robust Crowd Simulation</b><br>We show how the nonlinear, anticipatory forces seen in multi-agent systems can be made compatible with recent work on energy-based formulations in physics-based animation, and propose a simple and effective optimization-based integration scheme for implicit integration of such systems.<br><br>Karamouzas, Ioannis, Nick Sohre, and Stephen J. Guy. "Implicit Crowds: Optimization Integrator for Robust Crowd Simulation" <i>ACM Transactions on Graphics (Proceedings of SIGGRAPH 2017)</i> . |   |
|                              | <b>Data-Driven Sokoban Puzzle Generation with Monte Carlo Tree Search</b><br>Produced a data-driven estimation of puzzle difficulty from a user study and data analysis. Combined with MCTS Sokoban puzzle generation technique and performed a validation user study showing high accuracy of difficulty estimates<br><br>Kartal, Bilal, Nick Sohre, and Stephen J. Guy. "Data-Driven Sokoban Puzzle Generation with Monte Carlo Tree Search." <i>Twelfth Artificial Intelligence and Interactive Digital Entertainment Conference</i> . 2016.                                       |   |
|                              | <b>A Data-Driven Method for Variation in Animated Smiles</b><br>Utilized results from a user study to train a classifier to predict happy faces in a parameterized space. Used the classifier to produce a variety of new smiles<br><br>Nick Sohre, Stephen J Guy "A Data-Driven Method for Variation in Animated Smiles" (Poster) <i>Motion in Games 2016</i>  |   |
|                              | <b>Creating the perfect smile: spatiotemporal properties of effective facial expression</b><br>Conducted a user study to annotate digital facial expressions with emotional intent. Performed data analysis on results to discover new spatiotemporal subtleties of smiles.<br><br>Nathaniel E. Helwig, Nick E. Sohre, Mark R. Ruprecht, Stephen J. Guy, Sofia Lyford-Pike <i>Under submission to PLOS ONE</i>  |   |
|                              | <b>Research Experience</b>  | <b>University of Minnesota</b><br>Minneapolis, MN |
|                              | Designed and developed a user study app to collect data on smile effectiveness of patients after facial reconstructive surgery.<br>Performed unsupervised clustering on brain scan data to discover biotypes for high risk and Autism positive toddlers.  |   |
|                              | <b>University of Minnesota</b>  | 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:** 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.