**CSC 370: Artificial Intelligence**

**Spring 2015**

**Project Proposal**

**Team Members:**

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**Project Title:**

Depth Image Region Segmentation

What is your vision for the project? Describe what the goals of the project are and what A.I. areas, concepts, and/or algorithms you will be exploring.

We hope to use a segmentation algorithm to separate a depth image into regions containing cohesive surfaces using a pixel-based graph approach. This topic relates closely to computer vision and 3D modeling areas in AI. We plan to test several metrics of depth pixel similarity, including gradient difference and Laplacian edge detection. We hope to interactively display the software in near-real-time via a Kinect sensor.

What materials have you read as preliminary research? Wikipedia pages are ok for now, but your final paper should reference primary sources.

Dahan, Meir Johnathan, et al. "Combining color and depth for enhanced image segmentation and retargeting." *The Visual Computer* 28.12 (2012): 1181-1193.

Fan, Ting-Jun, Gerard Medioni, and Ramakant Nevatia. "Recognizing 3-D objects using surface descriptions." *Pattern Analysis and Machine Intelligence, IEEE Transactions on* 11.11 (1989): 1140-1157.

Chen, Liang-Chia, Xuan-Loc Nguyen, and Ching-Wen Liang. "Object segmentation method using depth slicing and region growing algorithms."*International Conference on 3D Systems and Applications, Tokyo, Japan*. 2010.

What are your benchmarks for success? Submit a bulleted list of 3-5 criteria by which the success of your project will be judged. Be as precise as possible. For example, “We will correctly describe and implement the Upper Confidence bounds for Trees algorithm”, or “Our system will learn to play Tetris at a level that outperforms a purely random agent.”

* Import range image data taken using a Kinect sensor.
* Segment a depth image using Laplacian edge detection and gradient difference metrics.
* Visually render segmented images against RGB reference images in an interactive display.