## Noise in 3D Laser Range Scanner Data

Professor Ralph Martin Cardiff University Website: http://ralph.cs.cf.ac.uk/

This talk concerns noise, a key issue in reconstructing models from scanner data. Two topics are discussed: the first is the nature of scanner noise, while the second gives a particular technique for removing noise from scanned models.

The first part of the talk looks at noise in range data measured by a Konica Minolta Vivid 910 scanner. Many papers on denoising 3D mesh data have often used artificial test data comprising Gaussian noise, which is independently distributed at each mesh point. Some papers even explicitly assume the noise to be of this kind when considering how to remove it. Measurements of an accurately machined, test surface indicate that real scanner data does not have such properties.

This second part of the talk considers an approach to mesh denoising based on the concept of random walks. The method consists of two stages: a weighted face normal filtering procedure, followed by a vertex position updating procedure which integrates the denoised face normals in a least-squares sense. The weights are based on the probability of arriving at a given neighbour after a random walk of a virtual particle. This a pproach is faster than many other feature-preserving mesh denoising algorithms.



original