VISION - 3D

DeepEdge

Point clouds are now massively acquired and used in various fields, from building to augmented reality. However, reconstruction and modeling remain a tedious and time-consuming task.

Detecting edges is often the first step towards shape interpretation. Existing algorithms performing this task tend to be slow and resource intensive.

DESCRIPTION*

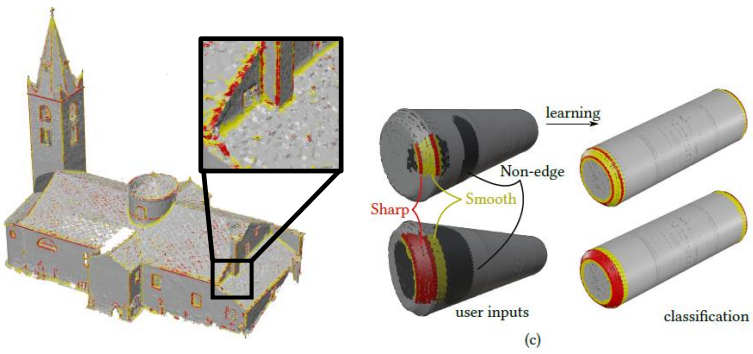
DeepEdge uses deep learning for detecting edges in a 3D point cloud. From a dataset acquired by photogrammetry, LIDAR or depth camera, it identifies all points belonging to an edge or close to it.

The tool offers a supervised learning interface, as the notion of edge is subjective and may vary depending on the project.

The neural network infers the edge definition during a learning phase. It can be trained with a set of annotated point clouds or interactively from user inputs. Pre-trained networks are also provided.

The model can then automatically process hundreds of millions of points, and it identifies points belonging to edges.

With a compact architecture, it offers high detection rates, has a great robustness to noise and is much faster (500.000 points/sec on a standard CPU) than traditional solutions.



(Left) Edge classification of an acquired model. (Right) Interactive learning: Classification results from two different user-defined edge definition.

TECHNICAL SPECIFICATIONS

- C++ library tailored for large-scale point clouds processing
- Process 500 000 points per second on a standard CPU

COMPETITIVE ADVANTAGES

- Low resource processing
- Great overall performances (speed, accuracy, precision)
- Pre-trained models
- Classification module
- Interactive learning

APPLICATIONS

- Shape recognition
- Reconstruction
- Modeling
- Object classification

INTELLECTUAL PROPERTY

- Software

DEVELOPMENT STAGE

- Technology validated in relevant environment

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LABORATORY

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