- blender.org
- code.blender.org

# User:Apinzonf/Gsoc2013/proposal

Apinzonf

- Apinzonf
- My talk
- My preferences
- My watchlist
- My contributions
- Log out

< User:Apinzonf

- User page
- Discussion
- Edit
- History
- Watch

Page

- What links here
- Related changes
- Permanent link

**From BlenderWiki**

# GSOC 2013 Sketch Mesh Editing

Name: Alexander Pinzon Fernandez

Email: apinzonf@gmail.com

IRC: apinzonf

www: http://apinzonf.wordpress.com/, http://wiki.blender.org/index.php/User:Apinzonf

## Synopsis

The mesh editing is generally done with affine transformations, Blender3D offers some tools to transform

the vertices as “proportional editing object mode” with which the transformation of some vertices is interpolated to the other vertices connected with the use of simple distance functions.

This project proposes to implement a method for mesh editing based on sketching lines defines by user and preserving the geometric details of the surface.

This method captures the geometric details using a differential coordinates representations. The differential coordinates captures the local geometric information (curvature and direction) of the vertex based on its neighbors. This method allows you to retrieve the best possible original model after changing the positions of some vertices using the differential coordinates of the original model.

This method also allows the user to define the desired transformation using sketch lines in the screen.

Paper used:

Nealen, A., et al. A Sketch-Based Interface for Detail-Preserving Mesh Editing. ACM Transactions on Graphics (TOG). ACM, 2005. p. 1142-1147.

Paper PDF: http://igl.ethz.ch/projects/Laplacian-mesh-processing/sketch-mesh-editing/sbime.pdf

Sorkine, O. Laplacian Surface Editing. Proceedings of the EUROGRAPHICS/ACM SIGGRAPH Symposium on Geometry Processing, 2004. p. 179-188.

Paper PDF: http://igl.ethz.ch/projects/Laplacian-mesh-processing/Laplacian-mesh-editing/laplacian-mesh-editing.pdf

Video: http://youtu.be/EMx6yNe23ug

A Sketch-Based Interface for Detail-P...

Video: http://youtu.be/38wF2Qnoc7A

Laplacian Mesh Editing

# Benefits to Blender

This project proposes a new tool for blender user that requires preserve the geometric details of the surface during a modeling, transformation, definition of the shape keys of the mesh vertexes.

This method allows editing the mesh using sketching session with grease pencil.

The method will allow novice users to edit any polygon mesh preserving the surface details.

This method allows the user to define new shape keys in a most fast and intuitive way.

Deliverables

1. A new sketch mesh editing tool for Blender.
2. Some pages of documentation to be included in the manual
3. A technical document for developers to improve the method in the future.
4. A tutorial explaining the use of the tool.

Project Details

The project would divide into several parts:

Calculate the differential coordinates. Store the fixed vertexes (Hard constraints). Detect object space silhouette. Find correspondences between space silhouette and sketch. Store positions of the edited vertexes. Reconstruct the surface – in least-squares sense. Generation of the documentation and tutorials.

Project Schedule

- 2 Weeks:- May 27 – Jun 09: Calculate the differential coordinates.
- 2 Weeks:- Jun 10 – Jun 23: Store the fixed vertexes (Hard constraints).
- 3 Weeks:- Jun 24 – Jul 14: Detect object space silhouette.
- 3 Weeks:- Jul 15 – Aug 04: Find correspondences between space silhouette and sketch.
- 2 Weeks:- Aug 05 – Aug 18: Store positions of the edited vertexes.
- 2 Weeks:- Aug 19 – Sep 01: Reconstruct the surface – in least-squares sense.
- 1 Weeks:- Sep 02 – Sep 08: Testing the tool and Define and implement graphical user integration.
- 2 Weeks:- Sep 09 – Sep 22: Generation of the documentation and tutorials.

# Bio

I graduated as systems engineer in Colombia in 2007.

I am a MSc computer science student at National University of Colombia.

Skeleton extraction and mesh smoothing are the research topics of my MSc. I am use CGAL, Graphite and Qt libraries.

Since 2007 I am a member of the Bioingenium Research Group of National University of Colombia.

I have been using Blender for about 10 years. I was working on the develop of a operator to remove noise from a mesh at GSOC 2012 – Blender suchi branch “Mesh Smoothing for 3d Scan Data”.

## WORK EXPERIENCE

2012 Google Summer of Code – Blender Foundation: “Mesh Smoothing for 3d Scan Data”.

2010 - Scire Foundation, Software Architect:

Design and development of web services data, hibernate and oracle.

Programming GUI with RichFaces.

Library of generic manipulation of trees, based on Java reflection techniques.

2005 - 2007 Sigtech, LTDA, Developer Engineer:

SIGC System Development for the "Departamento Administrativo de Catastro Distrital DACD".

Software used in development: Oracle 9i, Visual Basic 6, PL / SQL Developer.

2004 -2005 IIE and Colciencias, Student Monitor research:

Project: " Theater of Memory in Virtual Worlds:"

Architecture for handling streaming video that comes from a digital camcorder and put it as a texture of a 3D plane in a virtual setting, using the Java software, J3D, JMF, VRML, X3D.

## SOFTWARE DEVELOPED:

Nukak3D http://sourceforge.net/projects/nukak3d

3D medical image platform for visualization and image processing.

Nukak3d is a flexible architecture that integrates general-purpose graphics libraries such as VTK, ITK, VTKInria3D, OpenGL, under a graphical user interface (wxWidgets) for three-dimensional visualization and processing of medical images. On C++.

JNukak3D http://sourceforge.net/projects/jnukak3d

Software for three-dimensional visualization of DICOM images based on java.

JVC1394 http://sourceforge.net/projects/jvc1394/

Wrapper for the library Libdc1394 to enable communication with the Java programming language. Java Video Capture for IEEE 1394 cameras. On C, C++, Java, Swig.

## PUBLICATIONS

León J., Pinzón A., Sánchez C., Romero E. A distributed plugin based architecture for medical image processing. Proc. SPIE 8674, Medical Imaging 2013: Advanced PACS-based Imaging Informatics and Therapeutic Applications, 867403 (March 29, 2013);doi:10.1117/12.2007180.

Pinzón, A., Leon, J.C., Romero E., Diseño y desarrollo de una aplicación web para la visualización eficiente de imágenes medicas, con procesamiento 3D por software o por hardware. En Seminario Internacional de Procesamiento y Análisis de Imágenes Médicas SIPAIM 2009, (Noviembre 27-27, 2009), Bogotá Colombia.

Pinzón A., Romero E., Visualización 3D de imágenes médicas: una herramienta Open Source, En Seminario Internacional de Procesamiento y Análisis de Imágenes Médicas SIPAIM 2008, (Noviembre 24-27, 2008), Bogotá – Colombia.

Mendoza, B. U., Ramos, G. A., Mendez, L. M., Santamaria, W., and Pinzón, A. 2006. Camera Motion

Control from a Java 3D Environment: Virtual Studio Application in Decorative Arts Museum Collections. In Proceedings of the 2006 international Conference on Cyberworlds (November 28 - 29, 2006). CW. IEEE Computer Society, Washington, DC, 58-64.



# Contents