

# Author's Accepted Manuscript

Expeditious illustration of layer-cake models on and above a tactile surface

Daniel Simões Lopes, Daniel Mendes, Maurício Sousa, Joaquim Jorge



PII: S0098-3004(16)30033-4  
DOI: <http://dx.doi.org/10.1016/j.cageo.2016.02.009>  
Reference: CAGEO3709

To appear in: *Computers and Geosciences*

Received date: 14 August 2015  
Revised date: 9 February 2016  
Accepted date: 10 February 2016

Cite this article as: Daniel Simões Lopes, Daniel Mendes, Maurício Sousa and Joaquim Jorge, Expeditious illustration of layer-cake models on and above a tactile surface, *Computers and Geosciences* <http://dx.doi.org/10.1016/j.cageo.2016.02.009>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## Title

Expeditious Illustration of Layer-Cake Models On and Above a Tactile Surface

## Affiliation

Daniel Simões Lopes <sup>a\*</sup>, daniel.lopes@inesc-id.pt  
Daniel Mendes <sup>ab</sup>, danielmendes@tecnico.ulisboa.pt  
Maurício Sousa <sup>ab</sup>, mauricio.sousa@ist.utl.pt  
Joaquim Jorge <sup>ab</sup>, jorgej@tecnico.ulisboa.pt

<sup>a</sup> INESC-ID Lisboa

<sup>b</sup> Instituto Superior Técnico, Universidade de Lisboa

\* - corresponding author

## Abstract

Too often illustrating and visualizing 3D geological concepts are performed by sketching in 2D mediums, which may limit drawing performance of initial concepts. Here, the potential of expeditious geological modeling brought by hand gestures is explored. A spatial interaction system was developed to enable rapid modeling, editing, and exploration of 3D layer-cake objects. User interactions are acquired with motion capture and touch screen technologies. Virtual immersion is guaranteed by using stereoscopic technology. The novelty consists of performing expeditious modeling of coarse geological features with only a limited set of hand gestures. Results from usability-studies show that the proposed system is more efficient when compared to a windows-icon-menu-pointer modeling application.

## Keywords

Layer-cake models, illustrative geology, sketch-based modeling, spatial interaction, stereoscopic visualization

## 1. Introduction

Three dimensional visualizations of geological constructs are common in many geo-related fields since these communicate spatial relationships and possible structural configurations of geological objects effectively [Lidal, 2013; Turner, 2006]. Currently these visualizations are conveyed by 3D illustrations drawn on 2D media using conventional computer input such as mouse and keyboard. Recently-developed approaches propose 2D sketch-based systems to enable rapid geological modeling of terrains and stratigraphic elements [Lidal, 2013]. However, advanced stereoscopic visualization systems and new gesture-based spatial

Download English Version:

<https://daneshyari.com/en/article/10352381>

Download Persian Version:

<https://daneshyari.com/article/10352381>

[Daneshyari.com](https://daneshyari.com)