



## Alessandro Muntoni

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### EDUCATION AND TRAINING

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01/11/2014 – 06/03/2018

#### Ph.D. (EQF Level 8)

Ph.D. on Computer Science at the University of Cagliari, Italy; Thesis title: "Geometry Processing For Subtractive Fabrication" [Th.1]; Supervisor: prof. Riccardo Scateni.

**Research:** I focused my research on Digital Fabrication, 3D Printing, and CNC Milling, and I studied different algorithms and topics on the manufacturing of 3D models with subtractive technologies (like CNC milling machines). The main work I've done during my Ph.D. is the development of a robust algorithm for decomposing general 3D geometries into a small set of overlap-free height-field blocks which are manufacturable with 3-axis CNC milling machines. The research has been published in the journal "ACM Transactions on Graphics (TOG)" [J.2].

I've also worked on the following articles: [J.1], [J.3], [C.1], [C.2], [C.3].

I've also worked on the following technical reports: [TR.1], [TR.2].

**Visiting Period Abroad:** I was a visiting student at New York University (New York, USA) for five months in 2016. I've worked in collaboration with prof. Daniele Panofsky on an algorithm for the decomposition of 3D models in millable blocks using 3-Axis CNC milling machines. From this collaboration, the article [J.2] has been published.

01/01/2012 – 19/09/2014

#### Corso di Laurea Magistrale in Informatica – Master's Degree (EQF Level 7)

Master's Degree in Computer Science at the University of Cagliari, Italy.

**Score:** 110/110 cum Laude

**Visiting Period Abroad:** I've been a visiting student at the University of British Columbia (Vancouver, Canada) from 25/06/2014 to 26/08/2014. I've worked in collaboration with professor Alla Sheffer and Dr. Marco Livesu on my master thesis. The project was the development of an algorithm for the simplification of 3D digital shapes to polygonal meshes for the fabrication with sheets of rigid materials.

**Courses:** Image Analysis, Networking Architectures, Semantic of Programming Languages, Operative Systems 2, Geometric Algorithms and Spatial Data Structures, Data Mining, Network Computation, Databases 2, Computational Mathematics, Fundamentals of Security, Biometry and Security, Operations Research, Computer Architecture 2

01/01/2009 – 19/07/2012

#### Corso di Laurea in Informatica – Bachelor's Degree (EQF Level 6)

Bachelor's Degree in Computer Science at the University of Cagliari, Italy.

**Score:** 110/110 cum Laude

**Courses:** Discrete Mathematics, Computer Programming 1, Fundamentals of Computer Science, Physics, Computer Architecture 1, Automata and Formal Languages, Differential and Integral Calculus, Algorithms and Data Structures 1, System Administration, Computer Programming 2, Fundamentals of Law and Economy, Statistic, Operative Systems 1, Computer Networks, Databases 1, Informative Systems Programming, Human-Computer Interaction, Programming Languages, Numeric Methods, Software Engineering

15/07/2004 – 07/07/2009

#### Maturità Tecnica Industriale (EQF Level 4)

Istituto Tecnico Industriale Statale Othoca, Oristano (Italy)

**Score:** 97/100

### WORK EXPERIENCE

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04/11/2019 – ongoing

## Research Technologist

CNR - ISTI, Pisa, Italy

I am a Research Fellow of the Visual Computing Lab of CNR-ISTI in Pisa.

My main activity is to maintain the open source MeshLab [R.1], PyMeshLab [R.2], and VCGLib [R.3] projects. I am also contributor and co-maintainer of the TagLab [R.4], ReLight [R.5], Nexus [R.6], Corto [R.7] projects.

I am also continuing my research activity, which is focused on Computer Graphics, Digital Fabrication and Geometry Processing. I've worked on an article for enabling the fabrication of 3D shapes using 4-axis milling machines without decompositions. The article has been published in the journal "Computer Graphics Forum" and presented to EuroGraphics 2021: [J.5].

I've also worked to the following articles: [C.4], [C.5].

Bando di selezione n. 380.8 ISTI TEC del 31/07/2019, "SVILUPPO DI TECNOLOGIE E STRUMENTI SOFTWARE PER LA DIGITALIZZAZIONE 2D/3D E LE TECNOLOGIE di 3D FABRICATION SU PIATTAFORMA DI SVILUPPO C++/OPENGL", Durata: 1 anno. Provvedimento di Graduatoria: Protocollo 380008/2019 del 03/10/2019, CNR- ISTI. Prorogato di un anno: Protocollo n. 57961 del 23/09/2020, CNR- ISTI.

17/06/2019 – 16/10/2019

## Research Scholarship

University of Cagliari, Cagliari, Italy

I worked at the CG3HCI group of the Department of Mathematics and Computer Science at the University of Cagliari. I've worked on several projects of 3D digital fabrication with subtractive techniques. A project concern the realization of a user-driven application for the computation of decompositions that are manufacturable with 3-axis milling machines. The research has been published and presented at the conference "Smart Tools and Applications in Graphics (STAG)" [C.4]. I also worked on an algorithm for the calculation of automatic decomposition in double-sided height-field blocks.

I've also worked on a research project on electric consumption representation with information visualization technologies. The contract is stipulated within the research project titled "Tessuto Digitale Metropolitano" - CUP F23C17000010006, scientific coordinator: prof. Riccardo Scateni.

Bando n. 23/2019 per n. 1 Borsa di ricerca dal titolo "RAPPRESENTAZIONE DI CONSUMI ELETTRICI TRAMITE TECNICHE DI INFORMATION VISUALIZATION" Responsabile Scientifico prof. Riccardo Scateni, Durata: 4 mesi. Approvazione atti di borsa di ricerca, D.D. n. 248 ter del 18/06/2019.

21/02/2018 – 20/03/2019

## Research Technologist

CNR - ISTI, Pisa, Italy

I've been a Research Fellow of the Visual Computing Lab of CNR-ISTI in Pisa. My research was focused on Computer Graphics, mainly on Digital Fabrication and Geometry Processing. I worked on a project that wants to explore different ways of decomposing shapes in Double-Sided Height Field blocks, that can be manufactured with 3-axis milling machines in two passes with opposite directions. I've also worked on an article for enabling the fabrication of 3D shapes using 4-axis milling machines without decompositions.

I've also worked to the following articles: [C.3], [J.3], [J.4].

I've also worked in the SCIADRO project, in the topic of real-time acquisition of 3D scenes from mobile devices, with particular attention on the reconstruction of depth maps using calibrated images and sparse point sets.

Bando di selezione n. 15/2017 ISTI, "SVILUPPO DI ALGORITMI E SISTEMI PER DIGITALIZZAZIONE 2D/3D, LA CARATTERIZZAZIONE DEI DATI RILEVANTI E LA VISUALIZZAZIONE" Durata: 1 anno. Provvedimento di Graduatoria: Protocollo 0005749/2018 del 25/01/2018, CNR- ISTI.

20/12/2017 – 20/02/2018

## Research Contract

University of Cagliari, Cagliari, Italy

I worked at the CG3HCI group of the Department of Mathematics and Computer Science at the University of Cagliari. I focused my research on 3D Digital Objects Decompositions in blocks which can be fabricated with subtractive technologies [TR.2]. The contract is stipulated within the PRIN project titled "DSurf" - CUP F72F16001960001, scientific coordinator: prof. Riccardo Scateni.

Rep. 37/2017, contratto n. 29 del Dipartimento di Matematica e Informatica, Università di Cagliari. Selezione pubblica per il conferimento di n. 1 contratto di lavoro autonomo "DECOMPOSIZIONE DI OGGETTI 3D DIGITALI IN BLOCCHI FABBRICABILI MEDIANTE TECNOLOGIE SOTTRATTIVE" Responsabilie Scientifico prof. Riccardo Scateni, Durata: 4 mesi. Disposizione di approvazione atti avvisi pubblici di selezione n. 27-28 e 29/2017. D.D. n. 290 del 13/12/2017.

## VISITING PERIODS ABROAD

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31/03/2016 – 31/08/2016

### New York University, New York (USA)

I was invited by professor Daniele Panozzo, with an official invitation letter wrote on February 1, 2016, for a visiting student period during my Ph.D. at the New York University. The period was partially founded by my Ph.D. scholarship and partially funded by the NYU.

I've worked on the development of an algorithm for the decomposition of free-form 3D digital models in a small number of blocks millable with 3-axis CNC Milling Machines. I've worked under the supervision of prof. Daniele Panozzo at the New York University for five months, and the experience produced the article [J.2].

26/05/2014 – 25/08/2014

### University of British Columbia, Vancouver, Canada

I was invited by professor Alla Sheffer, with an official invitation letter wrote on April 3, 2014, for a visiting student period during my Master's degree at the University of British Columbia. The experience was funded by the GLOBUS program (D.R. n. 329, 17/01/2014), which promotes student mobility to the non-European territory.

The goal of the experience was the development of an algorithm for the simplification of three-dimensional shapes to facilitate the construction of wooden or paper models, using segmentation and deformation techniques studied by UBC and the University of Cagliari. I've worked under the supervision of professor Alla Sheffer and Dr. Marco Livesu at the University of British Columbia (Vancouver, Canada) for three months.

## PARTICIPATION TO RESEARCH PROJECTS

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### Tessuto Digitale Metropolitano

I've worked in the "Tessuto Digitale Metropolitano" Project on electric consumption representation with information visualization technologies.

Project Head: Enrico Gobetti

CUP: F23C17000010006

Financier: Agenzia regionale Sardegna Ricerche, POR FESR 2014-2020, Azione 1.2.2

Duration: 2017 – 2021

Work period: From 17/06/2019 to 16/10/2019, during the research scholarship contract held at University of Cagliari, financed by the project.

### SCIADRO (SCIami di DRoni)

I've worked in the Sciadro Project, which is a project that aims at designing, realizing and testing technologies and innovative sensors able to fulfill several fields requirements for environmental and territory protection and security with drones. I've worked in the topic of real-time acquisition of 3D scenes from mobile devices, with particular attention on the reconstruction of depth maps using calibrated images and sparse point sets.

Technical Director: CIONI Riccardo

CUP: D58I16000020008

Financier: MIUR-MISE-Regione Toscana DGRT 758/2013.

Duration: 01/09/2016 – 01/04/2019

Work period: From 21/02/2018 to 20/03/2019, during the research technologist contract held at CNR- ISTI, financed by the project.

**VIRTUOSO** I've worked in the Virtuoso project, which aimed at creating seamless interactive support for fitness and wellness activities in touristic resorts. In the project, I had the role of calculating body measurements starting from a 3D digital shape of the body acquired with a 3D scanner. The PI was professor Riccardo Scateni of the University of Cagliari.  
 Coordinator: SCATENI Riccardo  
 CUP F78C13000530002  
 Financier: Regione Sardegna, L.R. 7/2007, Bando 2013  
 Duration: 01/04/2014 – 01/09/2017  
 Work period: From 01/11/2014 to 01/09/2017.  
 Technical Report: [TR.1]  
 Publication: [C.2]

**DSURF (Scalable Computational Methods for 3D Printing Surfaces)** I've worked in the DSurf project, which aims to develop scalable algorithms to design surfaces with patterns of predictable appearance and mechanical properties, validating these algorithms with physical measurements. My role consisted of the study of manufacturability of shapes using subtractive fabrication techniques. The PI of the project was prof. Fabio Pellacini of the university of Roma Sapienza and the coordinator of the local unit was prof. Riccardo Scateni of the University of Cagliari.  
 Scientific Coordinator: PELLACINI Fabio  
 Scientific Manager: SCATENI Riccardo  
 University: Università degli Studi di CAGLIARI  
 Protocol: 2015B8TRFM\_004, Setctor ERC PE6  
 Duration: 01/02/2017 – 01/02/2020  
 Work period: From 01/02/2017 to 20/02/2018.  
 Technical Report: [TR.2]  
 Publications: [J.3], [C.3]

## **COURSES AND SUMMER SCHOOLS ATTENDED**

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I attended the following courses:

- "Shape Representation and Animation" held at the University of Cagliari by professor Loic Barthe, from 05 to July 14, 2017. It was composed of 21 hours, and it was worth four credits. Certificate released by Riccardo Scateni in quality of Vice-Director of the Dep. of Mathematics and Computer Science, University of Cagliari, July 17, 2017.
- "Measuring the User Experience" held at the University of Cagliari by professor Davide Spano, from 9 to February 20, 2017. It was composed of 21 hours, and it was worth four credits. Professor Riccardo Scateni released the certificate in quality of Vice-Director of the Dep. of Mathematics and Computer Science, University of Cagliari, February 22, 2017.
- Summer School in Copenhagen titled "Geometry and Algorithms for Architecture and Design", from 15 to June 19, 2015, organized by DTU. The Summer School was composed of 35 hours of lectures and exercises given by Alla Sheffer, Johannes Wallner and Konrad Polthier, a Symposium and an Industry Day. It was worth seven credits. Pia Christoffersen released the certificate in quality of Academic Officier, August 27, 2015.

## TALKS AND POSTERS

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I've presented the following talks and posters:

- Presentation of MeshLab [R.1] and PyMeshLab [R.2] at the "Evocation Workshop" 2020 held in Cagliari, Italy, 2/10/2020.
- Presentation of the article [C.4] at the "Smart Tools and Applications in Graphics" conference of 2019 in Cagliari, Italy, 14-15/11/2019.
- Presentation of the article [J.2] at the "ACM Siggraph Asia 2018" conference in Tokyo, Japan, 4-7/12/2018.
- Presentation of the article [C.3] at the "Smart Tools and Applications in Graphics" conference of 2018 in Brescia, Italy, 18-19/10/2018.
- Ph.D. Thesis Defense [Th.1], at University of Cagliari, Cagliari, Italy, 06/03/2018.
- A poster and a presentation at the "Doctoral Consortium" held at Eurographics 2017 in Lyon, France, 24-28/04/2017.
- Presentation of the Computer Graphics and Human-Computer Interaction Lab of the University of Cagliari at the "Smart Tools and Applications in Graphics" conference of 2016 in Genova, 3-4/10/2016.
- A poster titled "Algorithms for the Physical Fabrication of Shapes using 3-Axis Milling Machines" on the event titled "Notte dei Ricercatori", held in Cagliari, 28/09/2016.
- A poster titled "Simplifying the Shape of triangle meshes for Unfolding, Milling and Fabrication" on a workshop titled "Advanced Technologies from DENIS", held in Cagliari, 5/11/2015.

## TEACHING

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01/03/2016 – 31/01/2018

### Geometry Algorithms and Spatial Data Structures

Teaching assistant in the "Geometry Algorithms and Spatial Data Structures" course of the Master's Degree in Computer Science of the University of Cagliari, for three years (A.A. 2015/2016, A.A. 2016/2017 and A.A. 2017/2018). I taught in the laboratory part of the course, which was about C++ programming. The course has 40 attending students per year. The entire course is worth a total of 6 credits of the Master's Degree. I taught for 12 hours per year, plus the evaluation of the final project of the course.

01/10/2015 – 31/01/2018

### Computer Programming 1

Teaching assistant in the "Computer Programming 1" course of the Bachelor's Degree in Computer Science of the University of Cagliari, for three years (A.A. 2015/2016, A.A. 2016/2017 and A.A. 2017/2018). I taught in the laboratory part of the course. The entire course is worth a total of 12 credits of the Bachelor's Degree, and the laboratory part had a total worth of 6 credits. The course has 150 attending students per year. I taught for 72 hours per year, and the entire class was composed of 120 hours of lectures. I've also evaluated four intermediate tests per year and the final project of the course.

Bando di selezione A.A. 2016/2017 Art. 2 - D.M. n.976/2014 prot. n.27598 del 31/08/2016. Atto di approvazione Prot. n. 43175 del 03/10/2016. Bando di selezione A.A. 2017/2018 Art. 2 - D.M. n.976/2014 prot. n.126331 del 19/07/2017. Atto di approvazione Prot. n. 160040 del 28/09/2017.

01/04/2017 – 30/06/2017

### ChIP

Technological Tutor in the "ChIP" (a CHildren Introduction to Programming), a course in primary schools to teach programming to children, which was a Didactic Laboratory Project found by the Regione Sardegna in the project "Tutti a Iscol@" (iscola-lineab2.crs4.it). Responsabile Scientifico: Lucio Davide Spano. The experience concluded with the publication of the article [C.1].

## THESIS SUPERVISION

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- 2021 G. Pappalardo - "Improving the support for 3D scanned data in MeshLab and PyMeshLab", Bachelor Thesis, University of Pisa
- 2017 A. Tola - "Development of techniques for the subtractive fabrication", Bachelor Thesis, University of Cagliari
- 2017 S. Nuvoli - "Unfolding Polygon Meshes for the Fabrication of Simplified Shapes", Master Thesis, University of Cagliari
- 2016 A. Scalas - "Interactive editing of unfoldable reduced representations of 3D shapes", Master Thesis, University of Cagliari

## SOFTWARE

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### Publicly Accessible Software

I've contributed and I am the maintainer of MeshLab [R.1]. MeshLab is the popular open source software for processing and editing 3D triangular meshes, widely used in the Computer Graphics community for 3D acquisition, processing, cleaning and repairing of 3D meshes. MeshLab has an average of 25000 downloads per month. My contribution consisted on set up all the continuous integration GitHub Actions processes for automatic build and deploy of the software for all the three major platforms, reorganization of the code, adaptation for bindings with PyMeshLab [R.2], bug-fixing, development of new features and user assistance through GitHub issues, pull requests and discussions with the community. The official website is [meshlab.net/](http://meshlab.net/). My contributions, answered issues, discussion and pull requests can be found at the following link: [R.1].

I've contributed to the development of TagLab [R.4], a CNN based image segmentation tool oriented to marine data analysis. My contribution consisted on set up the installation and update of the software, and I am maintaining the deployment of the software for all the three major platforms. The official website is [taglab.isti.cnr.it/](http://taglab.isti.cnr.it/). My contributions can be found at the following link: [R.4].

I've developed all the code of the article [J.2] (based on CG3Lib). The WebPage of the project can be found at this link. My contributions can be found at the following link: [R.10].

I've developed all the code of the article [C.4] (based on CG3Lib). The WebPage of the project can be found at this link. My contributions can be found at the following link: [R.12].

I've contributed to the development of the source code of the article [J.5]. The WebPage of the project can be found at this link. My contributions can be found at the following link: [R.11].

### Libraries

I've developed the library PyMeshLab [R.2], which is a Python interface for batch processing of the main MeshLab filters. It allows to perform geometry processing, cleaning and repairing of meshes from python, making available all the multiple MeshLab features to the wide Python community. It is entirely written in C++, using the popular library pybind11 to bind C++ code to python. The library with all my contributions, answered issues, discussion and pull requests can be found at the following link: [R.2]; it can be downloaded and installed through the popular PyPi python package manager: [pypi.org/project/pymeshlab/](https://pypi.org/project/pymeshlab/); its documentation is available at the following link: [pymeshlab.readthedocs.io/](http://pymeshlab.readthedocs.io/)

During my research work, I've developed CG3Lib [R.9]: a simple free C++ library which provides algorithms and data structures for computational geometry and geometry processing, and allows an easy interface for other libraries like CGAL, LiblGL. The library with all my contributions can be found at the following link: [R.9].

I've contributed to the development and I am maintaining VCGLib [R.3], a C++ templated geometry processing library, with some bugfixes and small features. The library with all my contributions, answered issues, discussion and pull requests can be found at the following link: [R.3].

I've contributed with some bugfixes and small features to the OpenGR library [R.15].

**Other Software** I've developed significant parts of the following articles: [J.1], [C.2], [C.3] (based on CG3Lib), [J.3] (based on CG3Lib), [J.4] (based on CG3Lib).  
 I've developed a revised version of the U3D exporter that allows to convert IDTF mesh files to U3D mesh files for visualization of 3D objects through PDF files. The converter has been adapted in order to be used with MeshLab. My fork of the repository can be found at the following link: [R.13].  
 I've developed a revised version of the Multi-label optimization library for solving multi-label and graph-cut optimization problems. The code has been adapted in order to properly support both single and double precision floating point numbers, and has been cleaned up to be supported by recent compilers. My fork of the repository can be found at the following link: [R.14].

**Publicly Accessible University Projects** I've developed a part of the 5-people project of the Operations Research course for the Master's Degree in Computer Science at the University of Cagliari. The project was about the implementation of a Clarke and Wright algorithm for Vehicle-Routing-Problems based on the Voronoi Diagram of the input set of points. The code is available at the following link: [R.16].  
 I've developed the project of the Geometric Algorithms and Spatial Data Structures course for the Master's Degree in Computer Science at the University of Cagliari. The project was about the implementation of the 3D Convex Hull algorithm of a set of points. The code is available at the following link: [R.17].

**List of public repositories** List of public repositories that I am a contributor to:

- [R.1] MeshLab: the open source mesh processing system; Link: [github.com/cnr-isti-vclab/meshlab](https://github.com/cnr-isti-vclab/meshlab); DOI: 10.5281/zenodo.5114037
- [R.2] PyMeshLab: the open source mesh processing python library; Link: [github.com/cnr-isti-vclab/PyMeshLab](https://github.com/cnr-isti-vclab/PyMeshLab); DOI: 10.5281/zenodo.4438750
- [R.3] VCGLib: the C++ templated library for manipulation, processing and cleaning of triangle meshes; Link: [github.com/cnr-isti-vclab/vcglib](https://github.com/cnr-isti-vclab/vcglib); DOI: 10.5281/zenodo.5113905
- [R.4] TagLab: a CNN based image segmentation tool oriented to marine data analysis; Link: [github.com/cnr-isti-vclab/TagLab](https://github.com/cnr-isti-vclab/TagLab)
- [R.5] ReLight: a RTI library for creating and visualizing Reflectance Transformation Imaging; Link: [github.com/cnr-isti-vclab/relight](https://github.com/cnr-isti-vclab/relight); DOI: 10.5281/zenodo.5578273
- [R.6] Nexus: Link: a c++/javascript library for creation and visualization of a batched multiresolution mesh; [github.com/cnr-isti-vclab/nexus](https://github.com/cnr-isti-vclab/nexus)
- [R.7] Corto: mesh compression library, designed for rendering and speed; Link: [github.com/cnr-isti-vclab/corto](https://github.com/cnr-isti-vclab/corto)
- [R.8] MeshLab extra Plugins: extra plugins for MeshLab; Link: [github.com/cnr-isti-vclab/meshlab-extra-plugins](https://github.com/cnr-isti-vclab/meshlab-extra-plugins)
- [R.9] Cg3lib: a C++ geometry processing library; Link: [github.com/cg3hci/cg3lib](https://github.com/cg3hci/cg3lib); DOI: 10.5281/zenodo.4431777
- [R.10] HeightFieldDecomposition: source code for Transaction on Graphics 2018 paper "Axis-Aligned Height-Field Block Decomposition of 3D Shapes"; Link: [github.com/cg3hci/HeightFieldDecomposition](https://github.com/cg3hci/HeightFieldDecomposition)
- [R.11] 4AxisMilling: source code for Computer Graphics Forum 2021 paper "Automatic surface segmentation for seamless fabrication using 4-axis milling machines" paper Link: [github.com/cg3hci/4AxisMilling](https://github.com/cg3hci/4AxisMilling)
- [R.12] SplitAndMill: source code for STAG 2019 paper "Split and Mill: user assisted height-field block decomposition for fabrication"; Link: [github.com/cg3hci/SplitAndMill](https://github.com/cg3hci/SplitAndMill)
- [R.13] u3d: fork of the u3d exporter; Link: [github.com/alemuntoni/u3d](https://github.com/alemuntoni/u3d)
- [R.14] gco-v3: fork of the 'Multi-label optimization library'; Link: [github.com/alemuntoni/gco-v3.0](https://github.com/alemuntoni/gco-v3.0)
- [R.15] OpenGR: a C++ library for 3D Global Registration; Link: [STORM-IRIT/OpenGR](https://github.com/STORM-IRIT/OpenGR)
- [R.16] Clarke-Wright: University project for the 'Operations Research' course; Link: [github.com/alemuntoni/Clarke-Wright](https://github.com/alemuntoni/Clarke-Wright)
- [R.17] Convex Hull 3D: University project for the 'Geometry Algorithms and Spatial Data Structures' course; Link: [github.com/alemuntoni/ConvexHull3D](https://github.com/alemuntoni/ConvexHull3D)

## PUBLICATIONS

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### Journal

- [J.1] "Skeleton-driven Adaptive Hexahedral Meshing of Tubular Shapes". Marco Livesu, Alessandro Muntoni, Enrico Puppo, and Riccardo Scateni. Computer Graphics Forum 2016, 35(7):237-246. Presented at the Int. Conf. Pacific Graphics, Okinawa, Japan, October 2016. DOI: 10.1111/cgf.13021
- [J.2] "Axis-Aligned Height-Field Block Decomposition of 3D Shapes". Alessandro Muntoni, Marco Livesu, Riccardo Scateni, Alla Sheffer and Daniele Panofsky. ACM Transaction on Graphics (TOG), 37 (5), N. 169, 2018. Presented at the Int. Conf. ACM Siggraph Asia, December 2018. DOI: 10.1145/3204458
- [J.3] "Fabrication Oriented Shape Decomposition Using Polycube Mapping". Filippo A. Fanni, Gianmarco Cherchi, Alessandro Muntoni, Alessandro Tola, and Riccardo Scateni. Computer & Graphics, 2018, Vol 77, 183-193. DOI: 10.1016/j.cag.2018.10.010
- [J.4] "Mill and Fold: Shape Simplification for Fabrication". Alessandro Muntoni, Stefano Nuvoli, Andreas Scalas, Alessandro Tola, Luigi Malomo and Riccardo Scateni. Computer & Graphics, 2019, Vol 80, 17-28. DOI: 10.2312/stag.20191364
- [J.5] "Automatic surface segmentation for seamless fabrication using 4-axis milling machines". Stefano Nuvoli, Alessandro Tola, Alessandro Muntoni, Nico Pietroni, Enrico Gobbetti, Riccardo Scateni. Computer Graphics Forum, 2021, Vol 40-2, 191-203. Presented at the Int. Conf. EuroGraphics, Vienna, Austria, May 2021. DOI: 10.1111/cgf.142625.

### Conference

- [C.1] "ChIP: Teaching coding in primary schools". Fabio Sorrentino, Lucio Davide Spano, Sara Casti, Alessandro Carcangiu, Fabrizio Corda, Gianmarco Cherchi, Alessio Murru, Alessandro Muntoni, Stefano Nuvoli and Riccardo Scateni. 2017. CEUR Workshop Proceedings 1910, 106-110.
- [C.2] "A Seamless Pipeline for the Acquisition of the Body Shape: the Virtuoso Case Study". Marianna Saba, Fabio Sorrentino, Alessandro Muntoni, Sara Casti, Gianmarco Cherchi, Alessandro Carcangiu, Fabrizio Corda, Alessio Murru, Lucio Davide Spano, Riccardo Scateni, Ilaria Vitali, Ovidio Salvetti, Massimo Magrini, Andrea Villa, Andrea Carboni, and Maria Antonietta Pascali. Smart Tools and Apps for Graphics 2017, Catania, Italy. Eurographics Association. DOI: 10.2312/stag.20171229
- [C.3] "Simplification of Shapes for Fabrication with V-Groove Milling Tools". Alessandro Muntoni, Andreas Scalas, Stefano Nuvoli and Riccardo Scateni. Smart Tools and Applications in Graphics 2018, Brescia, Italy. Eurographics Association. DOI: 10.2312/stag.20181293
- [C.4] "Split and Mill - User assisted Height-Field block Decomposition for Fabrication". Alessandro Muntoni, Lucio Davide Spano and Riccardo Scateni. Smart Tools and Applications in Graphics 2019, Cagliari, Italy. Eurographics Association. DOI: 10.2312/stag.20191364
- [C.5] "Taglab: An human-centric AI system for interactive semantic segmentation". Gaia Pavoni, Massimiliano Corsini, Federico Ponchio, Alessandro Muntoni, Paolo Cignoni. Human Centered AI Workshop, NeurIPS 2021, accepted with minor revision. To be published.

### Technical Reports

- [TR.1] "A Seamless Pipeline for the Acquisition of the Body Shape: the Virtuoso Case Study". Marianna Saba, Fabio Sorrentino, Alessandro Muntoni, Sara Casti, Gianmarco Cherchi, Alessandro Carcangiu, Fabrizio Corda, Alessio Murru, Lucio Davide Spano, Riccardo Scateni. Rapporto Tecnico 01/17, Dipartimento di Matematica e Informatica, Università degli Studi di Cagliari.
- [TR.2] "A study of previous works and feasibility for the fabrication of 3D digital objects using subtractive techniques (Deliverable D1, DSURF Project)". Alessandro Muntoni, Riccardo Scateni. Rapporto Tecnico 02/17, Dipartimento di Matematica e Informatica, Università degli Studi di Cagliari.

### Thesis

- [Th.1] "Geometry Processing for Subtractive Fabrication". Alessandro Muntoni. Ph.D. Thesis, University of Cagliari, 2018.



## REVIEW

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I made peer review of research papers for the following journal:

- Transactions on Graphics (2020)

I made peer review for the "Thesis Award" for the "Smart Tools and Applications in Graphics" 2021 conference.

## SKILLS

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Mother Language Italian

Foreign Languages **English:** Cambridge English First (FCE) B2  
Certificate released by University of Cagliari CLA (Centro Linguistico d'Ateneo) on 06/06/2017.

**Skills** Experience in group working. Most of the university project I have worked on, and all of my research papers have been carried out in groups of four people at least.  
Experience in presenting projects carried out in Power Point presentations with different types of audiences.

**Digital Skills** Excellent computer science skills gained during the last ten years of studies, research and in the free time. Consolidated experience on modeling and 3D rendering, development, and design of applications for 3D graphics and GUIs. Consolidated expertise in the development of applications using C and C++ Languages (C++11, C++14 and C++17 standards), the primary C++ math and graphics libraries, like: Qt Framework, Boost, OpenGL, CGAL, LibIGL, Eigen, Gurobi, VCGLib, Ipopt, and the main build system generators like CMake and QMake. Good expertise on Java, Python, Latex languages. Good expertise on Continuous Integration tools for automatic multi-platform build and test systems, like: Github Actions, Travis.  
My code contributions can be found on my GitHub page: [github.com/alemuntoni](https://github.com/alemuntoni)  
Operative Systems (Linux, MacOS, Windows) : Excellent  
Programming : Excellent  
Network : Excellent  
Programming Languages: C++, C, Python, Latex, Java, Matlab, HTML, Javascript, PHP, OCaml, SQL, Assembly MIPS

## ADDITIONAL INFORMATION

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Driving licence Type B

Consapevole che – ai sensi dell'art. 76 del D.P.R. 445/2000 – le dichiarazioni mendaci, la falsità negli atti e l'uso di atti falsi sono puniti ai sensi del codice penale e delle leggi speciali, dichiaro che le informazioni rispondono a verità.  
Autorizzo il trattamento dei miei dati personali ai sensi del Dlgs 196 del 30 giugno 2003 e dell'art. 13 GDPR (Regolamento UE 2016/679) ai fini della ricerca e selezione del personale.

Pisa, 25/10/2021

