Andrea Tagliasacchi

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Technical skills

Languages : MATLAB, C/C++ (cross platform), Java, Latex

Software : MeshLAB, Blender, Adobe Premier, InkScape, Gimp

OS : MacOSX, Linux (Ubuntu), Windows

Education

- **Simon Fraser University** — BC - Canada
  Ph.D. Computer Science — *Sep. 2007 - Present*
  - Studies focus: Digital geometry processing - shape analysis
  - Achieved GPA: 4.0 – A
  - Supervisor: Dr. Richard H. Zhang (www.cs.sfu.ca/~haoz)

- **Politecnico di Milano** — CO - Italy
  M.Sc. Computer Engineering — *Sep. 2005 - Jun. 2007*
  - Studies focus: Theory and technology for sound processing and multimedia
  - Achieved GPA: 4.24 – A/A+ (29.60/30)
  - Thesis title: Calibration of physical models for the synthesis of string instruments
  - Supervisor: Dr. Augusto Sarti (www.elet.polimi.it/~sarti)
  - Achieved result: 100/100 *summa cum laude*

- **Politecnico di Milano** — CO - Italy
  B.Sc. Computer Engineering — *Sep. 2002 - Jun. 2005*
  - Studies focus: Digital signal processing
  - Achieved GPA: 4.24 – A/A+ (29.62/30)
  - Thesis title: Non-separable transforms in image coding
  - Supervisor: Dr. Stefano Tubaro (http://home.dei.polimi.it/tubaro/)
  - Achieved result: 100/100 *summa cum laude*

Work Experience

- **Simon Fraser University** — BC - Canada
  Research Assistant — *Jan. 2008 - Present*
  - Topics: Skeleton extraction; Surface reconstruction; Space-time registration; Shape correspondence
  - Faculty: Richard H. Zhang (www.cs.sfu.ca/~haoz)

- **Simon Fraser University** — BC - Canada
  Teaching Assistant — *Fall 2009*
  - Course: CMPT 128 - Intro. to C++ programming
  - Professor: John Edgar (johnwill@sfu.ca)

- **Simon Fraser University** — BC - Canada
  Teaching Assistant — *Summer 2009*
  - Course: CMPT 466 - Computer Animation

  - Professor: Richard H. Zhang (`www.cs.sfu.ca/~haoz`)

- **Simon Fraser University** BC - Canada
  Teaching Assistant *Spring 2009*
  - Course: CMPT 361 - Intro. to Computer Graphics
  - Professor: Richard H. Zhang (`www.cs.sfu.ca/~haoz`)

- **Simon Fraser University** BC - Canada
  Teaching Assistant *Fall 2007*
  - Course: CMPT 225 - Software Engineering I
  - Professor: Anne Lavergne (`www.cs.sfu.ca/~alavergn`)

Publications

- Oliver Van Kaick, Andrea Tagliasacchi, Lior Wolf, Richard Hao Zhang, Ghassan Hamarneh, Daniel Cohen-Or, "Knowledge-Driven Shape Correspondence through Semantic Labeling," submitted to SIGGRAPH 2010.
- Junjie Cao, Andrea Tagliasacchi, Matt Olson, Richard Hao Zhang, Zhixun Su, "Point Cloud Skeletons via Laplacian-Based Contraction," submitted to IEEE International Conference on Shape Modeling and Applications 2010.
- Qian Zheng, Andrei Sharf, Andrea Tagliasacchi, Baoquan Chen, Daniel Cohen-Or, Alla Shaffer, Hao Zhang, "Consensus Skeleton for Non-rigid Space-time Registration," to appear in proceedings of Eurographics 2010.
- Kai Xu, Hao Zhang, Andrea Tagliasacchi, Ligang Liu, Guo Li, Min Meng, and Yueshan Xiong. "Partial Intrinsic Reflectional Symmetry of 3D Shapes," ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia), 2009.
- Andrea Tagliasacchi, Richard Hao Zhang, Daniel Cohen-Or, "Curve skeleton extraction from incomplete point cloud," in ACM Transactions on Graphics (Proceedings of SIGGRAPH), 2009.
- Micah J Best, Alexandra Fedorova, Ryan Dickie, Alex Couture-Beil, Andrea Tagliasacchi, Craig Mustard, Shane Mottishaw, Zhi Feng Huang, Xiaoyuan Xu, Nasser Ghazali, Andrew Brownsword, Aron Brown, "Searching for Concurrent Design Patterns in Video Games: Practical lessons in achieving parallelism in a video game engine," to appear in Proceedings of the 15th International European Conference on Parallel and Distributed Computing (Euro-Par 2009), August 2009.
- Hao Zhang, Alla Sheffer, Daniel Cohen-Or, Qingnan Zhou, Oliver van Kaick, and Andrea Tagliasacchi, "Deformation-Drive Shape Correspondence," Computer Graphics Forum (Special Issue of Symposium of Geometry Processing 2008), Volume 27, Number 5, pp. 1431-1439, 2008.
- Andrea Tagliasacchi, Ryan Dickie, Alex Couture-Beil, Micah J. Best, Alexandra Fedorova, and Andrew Brownsword, "Cascade: A Parallel Programming Framework for Video Game Engines," in Proceedings of the Workshop on Parallel Execution of Sequential Programs on Multi-core Architectures (PESPMA), in conjunction with ACM-ISCA, Beijing, China, 2008.

Ongoing research

My research interest is focused in the field of geometry processing where I deal with 3D data and employ applied mathematic techniques to solve shape analysis problems. This topic has a strong artificial intelligence influence as we strive to increase the level of understanding of the 3D shapes a machine can achieve. My work has been mainly focused on axial representations and particularly curve-skeletons: compact graph structure which capture the essence of the shape. I developed algorithms for the

extraction of skeletons (based on symmetry analysis) and novel applications which employ such constructs. Currently my research is moving towards the study of more descriptive axial representations; the target is to improve surface reconstruction techniques in extreme missing data scenarios by using axial representations to capture the volumetric essence of the shape.

Other contributions to the research community

As a side product of my research, I developed several tools for the MATLAB environments whose source code is distributed with a BSD licence. Some of the code is implemented in the ".m" script language while the MEX/C++ bridge is used when better performances are required. The source is structured so that the libraries can be used both in MATLAB or independently from it, as simple C++ libraries. The two principal pieces of software that I developed are the *kdtree* data structure and the *geometry toolbox*. The latter is composed of a series of utilities for geometry processing research on curves, point clouds or triangular meshes.

More information can be found on the Mathworks homepage or the TriLAB documentation wiki:

- `http://www.mathworks.com/matlabcentral/fileexchange/authors/30596`
- `http://wiki.cs.sfu.ca/trilab`

Funding and awards

Jun. 2009 Faculty of Applied Sciences graduate fellowship

Jun. 2009 ACM student travel funding award (ACM SIGGRAPH 2009)

Mar. 2009 2006/2007 M.Sc. gold medalist (Politecnico di Milano)

Nov. 2009 Ralph M. Howatt Family graduate scholarship

Jun. 2008 ACM student travel funding award (ACM ISCA 2008)

Jun. 2008 CS minor travel funding award (ACM ISCA 2008)

Apr. 2007 Student excellence scholarship "Angelo Colombo"

Sep. 2002 – Jul 2007 Tuition waiver scholarship

Volunteering

- 2009 Graduate peer-support program coordinator
- 2008 Graduate peer-support volunteer