

Luca Bertelli

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Education

University of California, Santa Barbara March 2009
Ph.D. in Electrical and Computer Engineering
Thesis: "Variational Image Segmentation based on Pixel Pairwise Similarities"
Advisor: Prof. B. S. Manjunath

University of California, Santa Barbara December 2005
M.Sc. in Electrical and Computer Engineering
Major: Signal Processing - Minor: Communications

University of Modena, Italy December 2003
Laurea (D. Eng.) *magna cum laude* in Electronic Engineering

Research Interests

- 1) Variational methods for image segmentation, level set methods and PDEs-based segmentation and restoration.
- 2) Object recognition and image segmentation, importance of the spatial support in the discrimination process.
- 3) Shape and Prior Information, high-level knowledge integration in object detection and segmentation.

Experience

MayaChitra, Inc. - Santa Barbara, CA April 2009 - Present
Research Scientist
Worked on a variety of computer vision and image analysis problems, including the design and implementation of: a) the blending routines for the AIPR registration suite, b) the image segmentation module to be integrated in Mayachitra Imago and c) feature description and learning algorithms for aerial image classification.

Google, Inc. - Mountain View, CA July - September 2008
Software Engineer Intern
Worked within the Computer Vision group to develop and implement algorithms for automatic salient object detection (the work led to one patent, see below). The targeted applications span automatic image rescaling and cropping, saliency guided recognition and segmentation, foreground object annotation.

Broncus Technologies - Mountain View, CA January - June 2008
Consultant
Research and development of automatic methods for 2D-3D registration and segmentation of fluoroscopy and CT images of human lungs. Collaboration with Prof. Frederic Gibou from the Mechanical Engineering Department at UCSB.

The Burnham Institute - San Diego, CA May - November 2003
Software Engineer Intern
Development of classifiers to segment and evaluate the heart beat of fruit flies, acquiring and processing images either from a stored movie or directly from the camera connected to a microscope.

Teaching

University of California, Santa Barbara

Teaching Assistant

Signals and Systems (Continuous Time) - ECE 130A	Fall 2004
Led Discussion Sessions and Office Hours, Graded Homework and Finals	
Signals and Systems (Discrete Time) - ECE 130B	Winter 2005
Led Discussion Sessions and Office Hours, Graded Homework and Finals	
Signal Processing Applications - ECE 148	Spring 2005
Led Discussion Sessions and Office Hours, Graded Homework and Projects	
Advanced Digital Image Processing - ECE 278A	Fall 2007
Taught short course on Image Segmentation	

Publications

Journals

- [1] **Luca Bertelli**, S. Chandrasekaran, F. Gibou and B. S. Manjunath, "On the Length and Area Regularization for Multiphase Level Set Segmentation", submitted to International Journal on Computer Vision (**IJCV**), December 2008.
- [2] P. Ghosh, **Luca Bertelli**, B. Sumengen and B. S. Manjunath, "A Non-Conservative Flow Field for Robust Variational Image Segmentation", accepted for publication to IEEE Transactions on Image Processing (**TIP**), September 2009.
- [3] **Luca Bertelli**, B. Sumengen, B. S. Manjunath and F. Gibou, "A Variational Framework for Multi-Region Pairwise Similarity-based Image Segmentation", IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), vol. 20, n. 8, August 2008.
- [4] M. Zuliani, **Luca Bertelli**, C. Kenney, S. Chandrasekaran and B. S. Manjunath, "Drums, curve descriptors, and affine invariant region matching", Image and Vision Computing (**IVC**), vol. 26, no. 3, pp. 347-360, Mar. 2008
- [5] L. Ferrarini, **Luca Bertelli**, J. Feala, A. D. McCulloch, and G. Paternostro, "A more efficient search strategy for aging genes based on connectivity", **Bioinformatics**, Feb 2005; 21: 338 - 348.

Peer-Reviewed Conferences

- [6] M. E. Sargin, **Luca Bertelli**, B. S. Manjunath and K. Rose, "Probabilistic Occlusion Boundary Detection on Spatio-Temporal Lattices", IEEE International Conference on Computer Vision (**ICCV**), September 09, Kyoto, Japan.
- [7] M. Zuliani, **Luca Bertelli** and B. S. Manjunath, "An Automatic Method to Learn and Transfer the Photometric Appearance of Partially Overlapping Images" IEEE International Conference on Image Processing (**ICIP**), October 2008, San Diego, CA.
- [8] **Luca Bertelli**, P. Ghosh, F. Gibou and B. S. Manjunath, "Reference-based Probabilistic Segmentation as Non-Rigid Registration using Thin Plate Splines" IEEE International Conference on Image Processing (**ICIP**), October 2008, San Diego, CA.
- [9] **Luca Bertelli**, M. Zuliani and B. S. Manjunath, "Pairwise Similarities across Images for Multiple View Rigid/Non-Rigid Segmentation and Registration", IEEE International Conference on Computer Vision (**ICCV**), October 07, Rio de Janeiro, Brazil.
- [10] **Luca Bertelli**, J. Byun, B. S. Manjunath, "A Variational Approach to Exploit Prior Information in Object-Background Segregation: Application to Retinal Images", IEEE International Conference on Image Processing (**ICIP**), September 07, San Antonio, TX.
- [11] **Luca Bertelli**, B. S. Manjunath, "Edge Preserving Filters Using Geodesic Distances on Weighted Orthogonal Domains", IEEE International Conference on Image Processing (**ICIP**), September 07, San Antonio, TX.

[12] **Luca Bertelli**, B. Sumengen, B. S. Manjunath, "Redundancy in All Pairs Fast Marching Method", Proc. IEEE International Conference on Image Processing (**ICIP**), Atlanta, GA USA, Oct. 2006.

[13] B. Sumengen, **Luca Bertelli**, B. S. Manjunath, "Fast and Adaptive Pairwise Similarities for Graph Cuts-based Image Segmentation", Proc. IEEE **CVPR Workshop** on Perceptual Organization in Computer Vision (POCV), New York City, June 2006.

Patents

[1] **Luca Bertelli**, D. Strelow, S. Goldman, "Foreground Object Detection from Multiple Images", U.S. Serial Number 61/114446, issued November 2009.

Awards

Named **Outstanding Teaching Assistant** in Electrical Engineering for the year 2005-06.

Skills

Languages: Italian (mother tongue), English (fluent), French (scholastic).

Programming Languages: C, C++, Matlab.

Operating Systems: Mac OS X, Windows, Unix, Linux.

Others: MS Office, \LaTeX , Intel® Integrated Performance Primitives (IPP).