# CV — Samuel Gerber

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## EDUCATION

**PhD**, GPA: 3.95 Expected Fall 2010
Scientific Computing and Imaging Institute, University of Utah
Advisor: Ross T. Whitaker
Committee Members: Tolga Tasdizen, Hal Daumé III, Sarang C. Joshi, Davar Khoshnevisan

**Engineer Computer Science**, GPA: 3.71 Fall 2004
University of Applied Sciences Northwestern Switzerland
Thesis Advisor: Manfred Vogel

## PROFESSIONAL EXPERIENCE

**Research Assistant** 2006 - Ongoing
Scientific Computing and Imaging Institute, University of Utah, Salt Lake City
*My thesis research concerns the analysis of high dimensional scattered data, specifically how to reveal interesting structures in such data sets in an unsupervised manner. I address this question with the development of a new manifold learning algorithm based on a statistical representation of the data. Finally I adapt this approach to a formulation in shape space to investigate the variability in brain anatomy.*

**IPAM Fellow** 2007
Institute for Pure and Applied Math, University of California Los Angeles, Los Angeles
*Core participant in IPAM program on "Mathematics of Knowledge and Search Engines". Investigated the properties and use of the graph Laplacian for data analysis tasks. Began collaboration on shape detection in microscopy images.*

**Research Assistant** 2005 - 2006
Institute 4D Technologies and Data Spaces, University of Applied Sciences Northwestern Switzerland, Brugg
*Research on efficient numerical calculations and result visualization for a civil engineering application on structural behavior of beams under torsion and lateral stress.*

**Project Leader** 2004 - Ongoing
Jgeom library
*Lead developer of an open source geometry library in java (https://jgeom.dev.java.net).*

**Consultant** 2004
Consolidated Contractors Company (CCC), Athens, Greece
*Integration of geometrical boolean operations on meshes into existing software package.*

## AWARDS

**Stipend**, IPAM 2007

**Winner scholarship**, ABB Company 2005

**Winner scholarship**, Swiss friends of the USA 2005

**Best diploma thesis**, University of Applied Sciences Northwestern Switzerland 2004

## PUBLICATIONS

*Samuel Gerber, Hal Daumeé III, Tolga Tasdizen, Ross Whitaker.* **"A Variational Approach to Principal Surfaces"**, Journal of Machine Learning Research (JMLR), submitted

*Samuel Gerber, Tolga Tasdizen, Tom Fletcher, Sarang Joshi, Ross Whitaker.* **"Manifold Modeling for Brain Population Analysis"**, Invited paper for the journal of Medical Image Analysis

(MedIA), submitted

*Samuel Gerber, Tolga Tasdizen, Sarang Joshi, Ross Whitaker.* **"On the Manifold Structure of the Space of Brain Images"**, International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2009

*Samuel Gerber, Tolga Tasdizen, Ross Whitaker.* **"Dimensionality Reduction and Principal Surfaces via Kernel Map Manifolds"**, International Conference on Computer Vision (ICCV), 2009.

*Ran Tao, Thomas Fletcher, Samuel Gerber, Ross Whitaker.* **"A Variational Image-Based Approach to the Correction of Susceptibility Artifacts in the Alignment of Diffusion Weighted and Structural MRI"**, Information Processing in Medical Imaging (IPMI), 2009.

*Matthias Fuchs, Samuel Gerber.* **"Variational Shape Detection in Microscope Images Based on Joint Shape and Image Feature Statistics"**, In Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA), 2008.

*Samuel Gerber, Tolga Tasdizen, Ross Whitaker.* **"Robust Non-linear Dimensionality Reduction using Successive 1-Dimensional Laplacian Eigenmaps"**, International Conference on Machine Learning (ICML), 2007.

*Samuel Gerber*, **"3D Postprocessor"**. Diploma thesis, University of Northwestern Switzerland,2004

*Samuel Gerber*, **"Boolean Operations for NURBS"**. Semester thesis, University of Northwestern Switzerland, 2004

*Samuel Gerber, Urs Frick*, **"Boolean Operations for Java3d"**. Semester thesis, University of Northwestern Switzerland, 2003

## PRESENTATIONS

**On the Manifold Structure of the Space of Brain Images** September 2009
International Conference on Medical Image Computing and Computer Assisted Intervention

**On the Manifold Structure of the Space of Brain Images** September 2009
Computer Vision Laboratory, ETH Zürich

**Manifold Modeling for Population Analysis** June 2009
Laboratory of Mathematics in Imaging, Harvard Medical School Boston

**Principal Surfaces and Manifold Learning on Brain Images** June 2009
Institute for Pure and Applied Math, UCLA

**Variational Shape Detection in Microscope Images Based on Joint Shape and Image Feature Statistics** June 2008
Workshop on Mathematical Methods in Biomedical Image Analysis

**Robust Non-linear Dimensionality Reduction using Successive 1-Dimensional Laplacian Eigenmaps** June 2007
International Conference on Machine Learning

## COMPUTER SKILLS

**Programming**: C,C++, Java, R, Matlab, SQL, OpenGL, ITK

**Systems**: Linux, OS X, Windows

## LANGUAGE SKILLS

**English**: fluid — **German**: fluent — **Swiss-German**: native — **French**: beginner