

# Emmanuel Piuze-Phaneuf

McGill University  
School of Computer Science  
Date of Birth: March 30, 1986  
Citizenship: Canadian  
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## Education

Ph.D candidate. Computer Science. McGill University. 2011 – present.

**Thesis:** *To be determined.*

Side project: *Characterization of fiber bundles in the heart using diffusion imaging.*

Side project: *Detection and characterization of fanning fiber bundles with applications to tractography of brain MRI HARDI data.*

Side project: *A Physical Simulation of Tubulin Electrodynamics in Yeast Cell Division*

Side project: *A pseudo-physical Framework for Mapping Outdoor Terrains*

M.Sc Computer Science. McGill University. 2010.

**Thesis:** *Generalized Helicoids for Hair Modeling.*

Project: *Multimodal Image Registration by Maximization of Mutual Information.*

Project: *Cloth Dynamics and Hard Constraints Using a Particle System.*

B.Sc Honours Physics and Computer Science. McGill University. 2009.

**Final Project:** *Generalized Helicoids for Hair Modeling.*

Project: *Interactive Fine-tuning of Performance-driven Facial Animation.*

Project: *Chile CTI Observatory control and star polarimetry analysis.*

## Research Interests

I am interested in the mathematical analysis of images derived from medical imaging techniques as a means for modeling, interacting with, visualizing, and better understanding biological structures and processes, and diseases. From a Biomedical Engineering and Computer Science point of view, this analysis is conducted by combining computer vision concepts that comprise image segmentation, registration, quantification, perception, and enhancement (denoising, edge detection, contrasting, etc.) with knowledge of the physics and imaging of the underlying biological structures of interest.

Applications include image-guided interventions (IGI) and neurosurgery (IGNS), intervention planning, and the study of morphological changes in different populations.

## Publications

1. P. Savadjiev, G. J. Strijkers, A. J. Bakermans, E. Piuze, S. W. Zucker, K. Siddiqi. Heart wall myofibers are arranged in minimal surfaces to optimize organ function. Proceedings of the National Academy of Science (PNAS). 2012.

2. Emmanuel Piuze, Paul G. Kry, Kaleem Siddiqi. Generalized Helicoids for Modeling Hair Geometry. Eurographics 2011. *Computer Graphics Forum*. 2011.

## Honors & Awards

FQRNT (B2) doctoral research scholarship. 2010-2013.

Provost's Graduate Fellowship, McGill University, 2010.

Provost's Graduate Fellowship, McGill University, 2009.

NSERC USRA, McGill University, 2008.

Summer Research Fellowship, Université de Montréal, 2007.

## Teaching Assistant

Fundamentals of Computer Vision (COMP 558). McGill University. Winter 2012.

Fundamentals of Computer Graphics (COMP 557). McGill University. Fall 2011.

Fundamentals of Computer Graphics (COMP 557). McGill University. Fall 2009.

## Professional Activities

### *Invited Talks*

Eurographics 2011 conference, Llandudno, UK. April 11-15, 2011.

2011 Bellairs Workshop on Computer Animation: GRAND Challenges, Animation and Geometry. Bellairs Research Institute, Holetown, Barbados. February 19-25, 2011.

CIM-Perception Talk, McGill University. March 30, 2011.

Faculty of Science Open House, McGill University. January 25, 2010; November 8, 2009.

Faculty of Science Undergraduate Research Conference, McGill University. October 17, 2008.

CIM-Perception Talk, McGill University, October 9, 2008.

Computer Science Undergraduate Research Symposium, McGill University. August 27, 2008.

### *Workshops*

2011 Bellairs Workshop on Computer Animation: GRAND Challenges, Animation and Geometry. Bellairs Research Institute, Holetown, Barbados. February 19-25, 2011.

McGill Tomlinson Project in University Level Science Education (T-PULSE). McGill University, Canada, January 13-15, 2009.

Lipari School on Molecular and Medical Image Analysis and BioInformatics. Lipari, Italy, July 11-18, 2008.

## Undergraduate Academic Experience

### *McGill University, School of Computer Science*

Undergraduate NSERC Research Assistant. Supervised by Kaleem Siddiqi. 2008 – 2010.

Generalized Helicoids for Hair Modeling.

Undergraduate NSERC Research Assistant. Supervised by Paul G. Kry. 2008 – 2009.

Interactive Fine-tuning of Performance-driven Facial Animation.

Research Assistant, Joseph Vybihal. 2007 – 2008.

Scientific engineering software development.

### *Université de Montréal, Département de Physique*

Research Assistant, Pierre Bastien (former director of Mt. Megantic observatory), Summer 2007.

Chile CTI Observatory control and polarimetry framework development.

### *McGill University, Department of Physics*

Research Assistant, Gilbert Holder (Canada Research Chair in Cosmological Astrophysics), 2006.

Code development for cosmological SPH simulation code on computer clusters.

## Computer Skills

### *Programming Languages*

MIPS Assembly, C, C++, CSS, Fortran, HTML, IDL, Java, Javascript,  $\text{\LaTeX}$ , Maple, Matlab, Objective-C (iPhone development), PHP, Python, Shell, Ti-Basic, Visual Basic.

### *Frameworks, IDEs, and Softwares*

BCB, Blender, Eclipse, Microsoft Visual Studio, JOGL, OpenGL 1.0 & ES 2.0, Photoshop, QT Creator, VTK, Xcode.

### *Operating Systems*

Mac OS X, Windows, Linux.

## Personal Interests and Hobbies

See homepage: <http://www.cim.mcgill.ca/~epiuze>

## References

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D. Louis Collins  
Assistant Professor of Biomedical Engineering  
McGill University  
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<http://www.cim.mcgill.ca/~epiuze/data/files/CV.pdf>