Leo Grady

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Overview

My passion is to build new, innovative products using cutting edge technology. I focus on building an amazing team, providing vision and working together hands-on to plan, execute and iterate. In particular, I stress the importance of communication both within the team and cross-functionally within the company. I have focused primarily on products and R&D in the areas of machine learning, computer vision and medical imaging.

In addition to product development and R&D, I have also driven systematic innovation and intellectual property portfolio development and management.

Specialties: Executive R&D leadership, product/project management, software engineering, machine learning, computer vision, medical imaging, medical software development, intellectual property.

Work Experience

- **HeartFlow** Redwood City, CA
  Vice President of Research and Development *June 2012 – Present*
  - Led technology development of core (regulated) medical imaging software product. This product provides advanced algorithms for automated cardiovascular image analytics and an interactive guided workflow for user visualization, editing and review of the results. The software produces a hyper-precise personalized 3D model of the heart and coronary vasculature which provides a substrate for blood flow simulation. A key challenge of the software was designing the workflow/visualization/tools to achieve reproducibility across users. Conceived the overall vision for the software, led the development, oversaw usability testing, full V&V and transition into operational usage. Led group of ∼20 people during course of the product development.
  - Helped set strategic directions for the company in technology development and hiring.
  - Represented HeartFlow externally by making presentations and forging academic, clinical and industrial collaborations.
  - Managed and expanded Intellectual Property portfolio.

- **Siemens** Princeton, NJ
  Line Manager *Jan. 2010 – May 2012*
  Principal Research Scientist *April 2010 – May 2012*
  Senior Research Scientist *Sept. 2003 – April 2010 (senior since April 2008)*
  - As Line Manager: Line management for a group of 20 people, including research scientists and software engineers.
  - As Principal Research Scientist: Led projects and supervised junior scientists. Helped set strategic directions for technology development, hiring and acquisition. Represented Siemens Corporate Research internally and externally by making presentations and forging academic, clinical and industrial collaborations. Performed troubleshooting in crisis projects. Led research and development in areas of disruptive technologies.
  - As Senior (Principal) Research Scientist: Wrote proposals, acquired projects and supervised junior research scientists, students and interns to meet software deliveries for the projects, as well as to advance research goals.

- As (Senior) Research Scientist: Researched, developed, patented, published and gave talks on computer vision, machine learning, 3D and medical imaging.
- As (Senior) Research Scientist: Designed and developed computer vision software. Most applications of this software were in the area of medical image analysis, but also extended to non-medical projects such as airport security. This software was deployed in approximately 20 different Siemens (and Siemens partner) products.

Education

- **Boston University** Boston, MA
  Ph.D., Cognitive and Neural Systems (Dr. Eric Schwartz, advisor) *1999–2003*
  - Dissertation: "Space-Variant Machine Vision — A Graph Theoretic Approach"
- **University of Vermont** Burlington, VT
  B.Sc., Electrical Engineering (Computer Engineering Focus) *1995–1999*
  - Minors in applied mathematics and physics

Honors and Awards

- 2014: Inducted as a Fellow in the American Institute for Medical and Biological Engineering
- 2012: The **Edison Patent Award** for best patent in medical imaging was awarded for my Random Walker patent (7,460,709), due to its commercial impact and application to medical imaging. See the video https://www.youtube.com/watch?v=sbta_5zpV0A&list=PLWM4JZrnFZgx0w0KuGj5Uq9K4xAalRld8&index=15&feature=plpp_video

Software projects and products (HeartFlow)

- **FFRct**
  - The FFRct product is the central product of HeartFlow, which derives functional information from cardiac CT images to guide therapy decisions. Specifically, the product requires building a patient-specific 3D model of the coronary arteries and performing a fluid simulation of the blood flow to calculate a fractional flow reserve (FFR). The software consists of two pieces: An automated system for patient-specific 3D coronary artery modeling from a vendor-neutral CT image and a workstation to be used by internal HeartFlow technicians to review, validate and correct the 3D models. Once validated 3D models are obtained, these models were used for the fluid simulations and the results sent to the customer physician.
  - The key challenge of the automated image analytics is to leverage HeartFlow's large data repository to produce fast, accurate and robust algorithms. The key challenge of the internal workstation is to design a guided workflow and interactive tools that enables a technician to quickly check the 3D model and to reproducibly make edits. Reproducibility was a large challenge due to the variation among technicians and the need to deliver a reproducible service in a regulated environment. The team I led was responsible for delivering both the automated image analytics piece and the internal workstation software. My role was to design and lead the execution of the software development as well as oversee usability testing, V&V and deployment.

Software projects and products (Siemens)

- **Cardiovascular**
  - Automatic calculation of Proximal Isovelocity Surface Area (PISA) via analysis of Doppler and B-mode ultrasound
  - Automatic left ventricle segmentation in CT and MRI for calculation of ejection fraction and determination of heart efficiency.
  - Automatic determination of the standard cardiac views for display from CT images to improve the efficiency of the radiologist workflow.
  - Automatic four-chamber segmentation in CT images. Various diagnostic quantities can be determined from this calculation which open the door for further clinical research.
  - Automatic aorta segmentation in CT images, which is used as a preliminary step for coronary artery segmentation.
  - Automatic heart isolation in CT to improve coronary artery visualization on the heart surface.
  - Left atrium segmentation in CT for EP planning (atrial defibrillation).
  - Simulated CathLab visualization from CT images by suppressing the intensity of all non-coronary voxels.
  - Automatic myocardial wall thickness measurement of the left ventricle in CT data to provide guidance duration ablation procedures.
  - Interactive measurement of abdominal aortic aneurysms and thrombus for monitoring and treatment planning.
  - Automatic detection and localization of bleeding in the images obtained from a novel ultrasound device. This project (supported by DARPA) allowed us to build a device that can be used by a soldier with no medical background to cauterize bleeding in the extremities at the location of injury (e.g., in battlefield conditions). For press on this project, see: `http://www.sonoworld.com/Client/ModuleContent/ModuleContent.aspx?ContentId=1901`.
- **Oncology**
  - Interactive 2D and 3D tumor segmentation method for monitoring tumor volume in CT, MRI, diffuse optical tomography and ultrasound.
  - Developed interactive organ segmentation system for radiation therapy planning in CT and MRI images.
  - Developed a prostate segmentation module in MRI.
  - Interactive lymph node segmentation in MRI images for measurement and surgery planning.
  - Automatic liver and kidney segmentation in CT images for calculating tumor burden of these organs.
- **Skeletal**
  - Developed system to isolate and visualize the fetal skeleton in ultrasound images to provide an early warning of improper fetal development.
  - Developed a system for automatic and interactive segmentation of bone fragments in fracture cases for replacement and surgery planning.
  - Developed an interactive system for segmenting sinus cavities that was used to calculate the percentage of fluid fill.

  - Assisted development of rib unfolding visualization from CT acquisitions.

- ***In Vitro* Diagnostics**
  - Developed a system to predict Gleason score (cancer staging) from H&E stained prostate slices, obtained from a digital pathology system.
  - Developed a system to find and measure diagnostic pads for chemical urinalysis.
  - Developed a system to detect and classify virally infected cells.
  - Assisted development of a system for determining whether an H&E stained breast biopsy was malignant or benign. For press on this project, see:
    http://www.siemens.com/innovation/pool/en/publikationen/publications_pof/pof_fall_2011/machine_learning/pof0211_ml_medizin_en.pdf

- **Neural**
  - Using MRI and resting state fMRI, built a system which used network analytics to quantitatively assess if children have ADHD.
  - Built a system to quickly and accurately find point correspondence between cortical surfaces.

- **Compressed Sensing**
  - Developed a system for MRI image reconstruction from incomplete (sparse) samples acquired in k-space.

- **Security**
  - Developed a system that performed segmentation of the items inside luggage that was scanned using a CT machine.

- **Code online**
  - Designed, implemented and documented the Graph Analysis Toolbox for MATLAB, available freely (along with a complete demo package) at `http://cns.bu.edu/~lgrady/software.html`. The purpose of the software is to allow for the manipulation and analysis of data associated with graphs (e.g., images). The toolbox has been downloaded over ten thousand times since being made available online in 2003.
  - Research code from several papers written at Siemens is made available online.

Grant support

Grants are not a primary source of funding in industry. Nonetheless, I have received support from several grants:

NIH R01 HL094557-01A2 Improved Cardiac and Vascular Magnetic Resonance Imaging Using a Combination of Parallel Imaging and Compressed Sensing Concepts. Jan. 2010 – Jan. 2015

Total award: $3,490,481 Role: Co-Investigator, funded at 2.5% of the total award.

PI: Mark Griswold, Case Western Reserve University

The objective of this proposal is to produce a new level of gains in imaging speed and SNR for cardiac and vascular imaging by combining novel concepts of non-Cartesian parallel imaging techniques with the newly emerging compressed sampling theory. Compressed sensing promises to revolutionize the field of MRI by breaking the traditional link between imaging time and SNR. Here we will exploit these concepts to develop a set of completely new imaging strategies with dramatic increases in SNR and imaging speed. We specifically address computational limitations by

developing an open source software distribution for high-end graphical processing units. These processors promise to dramatically reduce computational time across the board in medical imaging. Ultimately we believe that these technologies, when viewed as a whole, will result in a novel class of methods for cardiac and vascular diagnosis which will provide an increase in image quality, SNR and speed in MRI, perhaps unparalleled in the evolution of MRI, resulting in dramatically improved imaging of MR angiography, cardiac function and cardiac perfusion.

Security Screening Segmentation Challenge (ALERT) . March 2011 – Dec. 2011

Total award: $70,000 Role: Principal Investigator, funded at 100% of the total award.

PI: Leo Grady, Siemens Corporate Research

There is a need to improve the performance of equipment used to detect objects of interest in items brought onto airplanes, particularly equipment which uses volumetric Computed Tomography (CT) to detect explosives in checked and carry-on baggage. Currently, volumetric CT scanners use automated target recognition (ATR) algorithms to identify objects of interest in the images that result from the volumetric CT scanning, and may or may not contain a step known as segmentation that identifies the voxels corresponding to potential objects of interest in the images as well as features about the potential objects of interest such as mass, density and volume. The accuracy of the segmentation step may be degraded by artifacts in CT images, including streaks, blooming, blurring and low frequency artifacts which are caused by the finite resolution of the scanner, sampling, beam hardening, scatter, limited dynamic range of the scanner and other sources. The performance of object of interest detection can be improved if the accuracy of the outputs of segmentation is improved. In cooperation with the Explosives Division of the Science and Technology Directorate of the Department of Homeland security we have participated in a challenge to perform completely automatic image segmentation on a sizeable set of volumetric CT images of real luggage.

NIH R01-CA-134493-01A1 A Platform for Cancer Biomarker Validation: Image Fusion using NIR Fluorescence. Jan. 2009 – Jan. 2014.

Total award: $745,852 Role: Co-Investigator, funded at 14% of the total award.

PI: John Frangioni, BIDMC

This is an academic-industrial collaboration aimed at developing NIR fluorescence-based technology that permits microscopic features of a tumor to be co-registered in 3D with macroscopic imaging studies, such as MRI and CT.

DARPA HR0011-08-3-0004 Deep Bleeder Acoustic Coagulation (DBAC) — Phase II. Aug. 2008 – Aug. 2010.

Total award: $11,256,966 Role: Technical Contributor, funded at 0.1% of the total award.

PI: Michael Sekins, Siemens Ultrasound

The DBAC program seeks to address the problem of life and limb threatening hemorrhage from penetrating combat wounds in soldiers. The design objective for the DBAC cuff system is to stop and control bleeding in wounded limbs, for both fast and slow bleeders, such that the onset of irreversible hemorrhagic shock is prevented. Hemorrhage from limb wounds is a dominant cause of morbidity and mortality in combat, and thus continues to be among the most severe problems for military operations.

The DBAC BAA requires autonomous detection and localization (targeting) of a bleeding vessel, as well as successful execution of acoustic hemostasis (focused ultrasound to affect deep cautery). The requirements are even more challenging in that the DBAC system must: (1) be extremely light-weight, (2) treat in minimal time, and (3) be successfully used by minimally-trained operators.

Professional activities

Journal Editor: Editorial board for the SIAM Journal on Imaging Sciences, editorial board for the Journal of Mathematical Imaging and Vision

Area Chair: Area chair for MICCAI 2012, MICCAI 2013, MICCAI 2014, CVPR 2013 and CVPR 2014.

Grant boards: Served on grant board for NSF computer vision panel.

Associations: Member of IEEE, the MICCAI society and Tau Beta Pi (engineering honors fraternity).

Committees: Program committee member for the conferences: European Conference on Computer Vision (ECCV), Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR) and International Conference on Distributed Smart Cameras. Program committee member for the workshops: Interactive Computer Vision, Perceptual Organization for Computer Vision, Structured Models in Computer Vision, Information Theory in Computer Vision and Pattern Recognition.

Tutorials:

CVPR 2007: *Fundamentals linking discrete and continuous approaches to computer vision - A topological view.* The course page is at `http://www.cns.bu.edu/~lgrady/Short_Course.html` and slides (from a similar, abbreviated coarse) are available at: `https://www.ipam.ucla.edu/publications/gc2008/gc2008_7718.zip`.

ECCV 2008: *Combinatorial Calculus in Computer Vision: Formulating and Solving Continuous PDEs on Graphs.* The course page is at `http://cns.bu.edu/~lgrady/Short_Course_ECCV08.html` and slides are available at: `http://cns.bu.edu/~lgrady/ECCV08_tutorial_grady_bougleux.zip`.

Invited talks:

- University of Iowa, Iowa Institute for Biomedical Engineering, Dec. 2014.
- University of California Berkeley, Simons Institute, Nov. 2014.
- **Keynote speaker at the SIAM Conference on Imaging Science, May 2014.**
- MIT, May 2014.
- Microsoft Research, Cambridge UK, Dec. 2013.
- **Keynote speaker at the Workshop on Medical Computer Vision, in conjunction with MICCAI 2013, Sept. 2013.**
- **Keynote speaker at the Workshop on Mesh Processing in Medical Image Analysis, in conjunction with MICCAI 2013, Sept. 2013.**
- INRIA Rocquencourt, Mathematical Modeling and Numerical Solutions of Biological Flows, May 2013.
- University of Tokyo, May 2013.
- UC Berkeley, Department of Electrical Engineering and Computer Sciences, Sept. 2012.
- Technical University of Munich, Department of Computer Aided Medical Procedures and Augmented Reality, March 2012.

- New York University/Courant Institute of Mathematical Sciences, Department of Computer Science, Feb. 2012.
- University of Pennsylvania, Department of Computer Science, Dec. 2011.
- Rutgers University, Department of Computer Science, Dec. 2011.
- University of Pennsylvania, Department of Radiology, Nov. 2011.
- Banff International Research Station, Workshop on Geometry for Anatomy, Aug. 2011.
- **Keynote speaker at the International Symposium on Mathematical Morphology, July 2011.**
- Cornell University, Department of Computer Science, June 2011.
- University of Toronto, Fields Institute, June 2011.
- University of Twente, Institute for Biomedical Technology and Technical Medicine, Jan. 2011.
- University of Wisconsin, Department of Computer Science, Dec. 2010.
- **Keynote speaker at the International Conference on Image and Signal Processing, June 2010.**
- Université Paris 13, Département de Mathématiques, May 2010.
- Mitsubishi Electric Research Lab (MERL), July 20th, 2009.
- Workshop on Histology Image Analysis (talk and panel discussion), Ohio State University, July 6th, 2009.
- SPIE Photonics West '09: Multimodal Biomedical Imaging, International Symposium on Biomedical Optics, Jan. 24th, 2009.
- Drexel University, Department of Computer Science, Jan. 12th, 2009.
- MIT/MGH, Martinos Center for Biomedical Imaging, Dec. 3rd, 2008.
- Université Paris-Est, ESIEE, Oct. 17th, 2008.
- Microsoft Research, Cambridge UK, Oct. 11th, 2008.
- Imperial College of London and GlaxoSmithKline, Clinical Imaging Center, Oct. 9, 2008.
- University College London, Department of Computer Science, Oct. 8th, 2008.
- Université de Caen Basse-Normandie, GREYC Lab, Oct. 6th, 2008.
- Boston University, Department of Computer Science, Aug. 13th, 2008.
- University of California Los Angeles, Institute for Pure and Applied Mathematics, in conjunction with the "Graph Cuts and Related Discrete or Continuous Optimization Problems" program, Feb. 25th, 2008.
- University of Maryland, Norbert Weiner Center for Harmonic Analysis and Applications, in conjunction with the "February Fourier Talks", Feb. 21st, 2008.
- Johns Hopkins University, Center for Imaging Science, Oct. 2nd, 2007.

- **Keynote speaker at the "6th IAPR-TC-15 Workshop on Graph-based Representations in Pattern Recognition", Universidad de Alicante, June 12th, 2007**
- University of Minnesota, Institute for Mathematics and Applications, Feb. 22nd, 2006
- Université Paris Dauphine, in conjunction with "Mathematics and Image Analysis 2006", Sept. 19th, 2006
- Stevens Institute of Technology, Department of Computer Science, Mar. 28th, 2005
- University of Utah, Scientific Computing and Imaging Institute, Jan. 14th, 2005

Student supervision

- **PhD: As thesis committee member**
  - Herve Lombaert, École Polytechnique, Montreal (advisor: Farida Cheriet). Graduated in June 2012. Supervised internship at Siemens Corporate Research in 2010.
  - Daniel Weller, MIT (advisor: Vivek Goyal). Graduated in Jan. 2012. This collaboration also included Prof. Elfar Adalsteinsson (MIT) and Lawrence Wald (MGH).
  - Camille Couprie, ESIEE, Paris (co-advisors: Hugues Talbot and Laurent Najman). Graduated in October, 2011. Supervised internship at Siemens Corporate Research in 2008. Camille's thesis won the EADS prize for best PhD thesis in an inter-discplinary space and second place in the Gilles Kahn prize.
- **PhD: As thesis examiner**
  - Pierre-Yves Baudin, Ecole Centrale de Paris (advisor: Nikos Paragios). "Graph-Based Segmentation of Skeletal Striated Muscles in NMR Images", May 2013.
  - Ahmed Besbes, Ecole Centrale de Paris (advisor: Nikos Paragios). "Image Segmentation using MRFs and Statistical Shape Modeling", Sept. 2010.

Publications

Bibliometrics — Approx. total citations: 4,300, h-index: 27, i10-index: 57 (Google Scholar)
Books:

1. Olivier Lezoray and Leo Grady, "Image Processing and Analysis with Graphs: Theory and Practice", CRC Press. Release date: July 3rd, 2012.
   `http://www.amazon.com/Image-Processing-Analysis-Graphs-Practice/dp/1439855072/`
2. Leo Grady and Jonathan R. Polimeni, "Discrete Calculus: Applied Analysis on Graphs for Computational Science", 2010, Springer.
   `http://www.amazon.com/Discrete-Calculus-Applied-Analysis-Computational/dp/1849962898`

Journal:

1. Sethuraman Sankaran, Leo Grady, Charles A. Taylor, "Impact of geometric uncertainty on hemodynamic simulations using machine learning", Computer Methods in Applied Mechanics and Engineering, 2015.

2. Sethuraman Sankaran, Leo Grady, Charles A. Taylor, "Fast computation of hemodynamic sensitivity to lumen segmentation uncertainty", IEEE Trans. on Medical Imaging, 2015.

3. Herve Lombaert, Leo Grady, Xavier Pennec, Nicholas Ayache, Farida Cheriet, "Spectral Log-Demons - Diffeomorphic Image Registration with Very Large Deformations", International Journal of Computer Vision, Vol. 107, pp. 254–271, 2014.

4. Camille Couprie, Leo Grady, Laurent Najman, Jean-Christophe Pesquet, and Hughes Talbot, "Dual Constrained TV-based regularization on graphs", SIAM Journal on Imaging Sciences, Vol 6, No. 3, pp. 1246-1273, 2013.

5. Daniel S. Weller, Jonathan Polimeni, Leo Grady, Larry Wald, Elfar Adalsteinsson and Vivek K Goyal, "Sparsity-Promoting Calibration for GRAPPA Accelerated Parallel MRI Reconstruction", IEEE Trans. on Medical Imaging, Vol. 32, No. 7, pp. 1325-1335, July 2013.

6. Herve Lombaert, Leo Grady, Jonathan R. Polimeni and Farida Cheriet, "FOCUSR: Feature Oriented Correspondence using Spectral Regularization — A Method for Precise Surface Matching", IEEE Trans. on Pattern Analysis and Machine Intelligence, Vol 35, No. 9, pp. 2143-2160, Sept. 2013.

7. Noha El-Zehiry and Leo Grady, "Combinatorial Optimization of the Multiphase Mumford-Shah Functional", International Journal of Computer Vision, Vol 104, No. 3, pp. 270-285, Sept. 2013.

8. Jason W. Bohland, Sara Saperstein, Francisco Pereira and Leo Grady, "Network, anatomical, and non-imaging measures for the prediction of ADHD diagnosis in individual subjects", Frontiers in Systems Neuroscience, Vol. 6, Dec. 2012.

9. Daniel S. Weller, Jonathan R. Polimeni, Leo Grady, Lawrence L. Wald, Elfar Adalsteinsson and Vivek K. Goyal, "Denoising Sparse Images from GRAPPA using the Nullspace Method (DESIGN)", Magnetic Resonance in Medicine, Vol. 68, No. 6, pp. 1176-1189, 2011.

10. Parmeshwar Khurd, Leo Grady, Rafiou Oketokoun, Hari Sundar, Tejas Gajera, Summer Gibbs-Strauss, John V. Frangioni and Ali Kamen, "Global Error Minimization in Image Mosaicing Using Graph Connectivity and its Applications in Microscopy", Journal of Pathology Informatics, Vol. 2, No. 8, 2011.

11. Camille Couprie, Leo Grady, Laurent Najman and Hugues Talbot, "Combinatorial Continuous Max Flow", SIAM J. on Imaging Sciences, Vol. 4, No. 3, pp. 905–930, 2011.

12. Kambiz Frounchi, Lionel C. Briand, Leo Grady, Yvan Labiche, Rajesh Subramanyan, "Automating Image Segmentation Verification and Validation by Learning Test Oracles", Information and Software Technology, Vol. 53, No. 12, pp. 1337–1348, Dec. 2011.

13. Camille Couprie, Leo Grady, Laurent Najman and Hugues Talbot, "Power Watersheds: A Unifying Graph Based Optimization Framework", IEEE Trans. on Pattern Analysis and Machine Intelligence, Vol. 33, No. 7, pp. 1384–1399, July 2011

14. Leo Grady, "Minimal Surfaces Extend Shortest Path Segmentation Methods to 3D", IEEE Trans. on Pattern Analysis and Machine Intelligence, Vol. 32, No. 2, pp. 321–334, Feb. 2010.

15. Leo Grady and Christopher Alvino, "The Piecewise Smooth Mumford-Shah Functional on an Arbitrary Graph", IEEE Trans. on Image Processing, Vol. 18, No. 11, pp. 2547–2561, Nov. 2009.

16. Leo Grady, "Random Walks for Image Segmentation", IEEE Trans. on Pattern Analysis and Machine Intelligence, Vol. 28, No. 11, pp. 1768–1783, Nov., 2006.

17. Leo Grady and Eric L. Schwartz, "Isoperimetric Partitioning: A new algorithm for graph partitioning", SIAM Journal on Scientific Computing, vol. 27, no. 6, pp. 1844–1866, June 2006.

18. Leo Grady and Eric L. Schwartz, "Isoperimetric Graph Partitioning for Image Segmentation", IEEE Trans. on Pattern Analysis and Machine Intelligence, vol. 28, no. 3, pp. 469–475, March 2006.

Invited Book Chapters:

1. Leo Grady, "Targeted Image Segmentation Using Graph Methods", in "Image Processing and Analysis with Graphs", ed. Olivier Lezoray and Leo Grady, CRC Press 2012.

2. Olivier Lezoray and Leo Grady, "Graph Theory Concepts and Definitions used in Image Processing", in "Image Processing and Analysis with Graphs", ed. Olivier Lezoray and Leo Grady, CRC Press 2012.

3. Dheeraj Singaraju, Leo Grady, Ali Kemal Sinop, René Vidal, "Continuous Valued MRFs for Image Segmentation", In "Markov Random Fields for Vision and Image Processing", pp. 127–142, ed. Andrew Blake, Pushmeet Kohli, Carsten Rother, MIT Press 2011.

4. Leo Grady, Yiyong Sun and James Williams, "Three Interactive Graph-Based Segmentation Methods Applied to Cardiovascular Imaging", In "Mathematical Models in Computer Vision: The Handbook", pp. 453–469, ed. Nikos Paragios, Yunmei Chen, Oliver Faugeras, Springer 2006.

Double Blind Refereed Conferences with Less than 30% Acceptance Rate (Full Papers):

1. Sethuraman Sankaran, Leo Grady and Charles Taylor, "Real-Time Sensitivity Analysis of Blood Flow Simulations to Lumen Segmentation Uncertainty", Proc. of MICCAI 2014.

2. Petter Strandmark, Johannes Ulén, Fredrik Kahl, Leo Grady "Shortest Paths with Curvature and Torsion", Proc. of ICCV 2013.

3. Noha El-Zehiry, Michelle Yan, Sara Good, Tong Fang, S. Kevin Zhou, Leo Grady, "Learning the manifold of quality ultrasound acquisition", Proc. of MICCAI 2013.

4. Herve Lombaert, Leo Grady, Xavier Pennec, Nicholas Ayache and Farida Cheriet, "Spectral Demons - Image Registration via Global Spectral Correspondence", Proc. of ECCV, pp. 30-44, 2012.

5. Leo Grady, Vivek Singh, Timo Kohlberger, Christopher Alvino and Claus Bahlmann, "Automatic Segmentation of Unknown Objects, with Application to Baggage Security", Proc. of ECCV, pp. 430-444, 2012.

6. Timo Kohlberger, Vivek Singh, Chris Alvino, Claus Bahlmann and Leo Grady, "Evaluating Segmentation Error Without Ground Truth", Proc. of MICCAI, Vol. 7510, pp. 528-536, 2012.

7. Maxwell D. Collins, Jia Xu, Leo Grady and Vikas Singh, "Random Walks for Multi Image Cosegmentation: Quasiconvexity Results and GPU-based Solutions", Proc. of CVPR 2012.

8. Leo Grady, Marie-Pierre Jolly and Aaron Seitz, "Segmentation from a Box", Proc. of ICCV, pp. 367–374, 2011.

9. Leo Grady, Saurabh Datta, Oliver Kutter, Christophe Duong, Wolfgang Wein, Stephen H. Little, Stephen R. Igo, Shizhen Liu and Mani Vannan, "Regurgitation Quantification Using 3D PISA in Volume Echocardiography", Proc. of MICCAI, pp. 512–519, 2011.

10. Herve Lombaert, Leo Grady, Jonathan R. Polimeni and Farida Cheriet, "Fast Brain Matching with Spectral Correspondence", Proc. of IPMI, pp. 660–673, 2011.

11. Noha El-Zehiry and Leo Grady, "Fast Global Optimization of Curvature", Proc. of CVPR, pp. 3257–3264, 2010.

12. Camille Couprie, Leo Grady, Laurent Najman and Hugues Talbot, "Power Watersheds: A New Image Segmentation Framework Extending Graph Cuts, Random Walker and Optimal Spanning Forest", Proc. of ICCV, pp. 731–738, 2009.

13. Marie-Pierre Jolly, Hui Xue, Leo Grady and Jens Guehring "Combining Registration and Minimum Surfaces for the Segmentation of the Left Ventricle in Cardiac Cine MR Images", Proc. of MICCAI, pp. 910–918, 2009.

14. Dheeraj Singaraju, Leo Grady and René Vidal, "P-Brush: Continuous Valued MRFs with Normed Pairwise Distributions for Image Segmentation", Proc. of CVPR, 2009.

15. Leo Grady and Christopher Alvino, "Reformulating and Optimizing the Mumford-Shah Functional on a Graph — A Faster, Lower Energy Solution", Proc. of ECCV, pp. 248–261, 2008.

16. Leo Grady, "A Lattice-Preserving Multigrid Method for Solving the Inhomogeneous Poisson Equations used in Image Analysis", Proc. of ECCV, pp. 252–264, 2008.

17. Leo Grady and Marie-Pierre Jolly, "Weights and Topology: A Study of the Effects of Graph Construction on 3D Image Segmentation", Proc. of MICCAI, vol. 1, pp. 153–161, 2008.

18. Dheeraj Singaraju, Leo Grady and René Vidal, "Interactive Image Segmentation Via Minimization of Quadratic Energies on Directed Graphs", Proc. of CVPR 2008, 2008.

19. Leo Grady and Ali Kemal Sinop, "Fast Approximate Random Walker Segmentation Using Eigenvector Precomputation", Proc. of CVPR, 2008.

20. Ali Kemal Sinop and Leo Grady, "A Seeded Image Segmentation Framework Unifying Graph Cuts and Random Walker Which Yields A New Algorithm", Proc. of ICCV, 2007.

21. Ali Kemal Sinop and Leo Grady, "Uninitialized, Globally Optimal, Graph-Based Rectilinear Shape Segmentation — The Opposing Metrics Method", Proc. of ICCV 2007, 2007.

22. Leo Grady, Gareth Funka-Lea, "An Energy Minimization Approach to the Data Driven Editing of Presegmented Images/Volumes", Proc. of MICCAI, vol. 2, pp. 888–895, 2006.

23. Ali Kemal Sinop, Leo Grady, "Accurate Banded Graph Cut Segmentation of Thin Structures Using Laplacian Pyramids", Proc. of MICCAI, vol. 2, pp. 896–903, 2006.

24. Leo Grady, "Computing Exact Discrete Minimal Surfaces: Extending and Solving the Shortest Path Problem in 3D with Application to Segmentation", Proc. of CVPR, vol. 1, pp. 69–78, 2006.

25. Leo Grady, "Fast, Quality, Segmentation of Large Volumes — Isoperimetric Distance Trees", Proc. of ECCV, vol. 3, pp. 449–462, 2006.

26. Daniel Cremers, Leo Grady, "Statistical Priors for Efficient Combinatorial Optimization via Graph Cuts", Proc. of ECCV, vol. 3, pp. 263–274, 2006.

27. Leo Grady, Thomas Schiwietz, Shmuel Aharon, Rudiger Westermann, "Random Walks for Interactive Organ Segmentation in Two and Three Dimensions: Implementation and Validation", Proc. of MICCAI, vol. 2, pp. 773–780, 2005.

28. Herve Lombaert, Yiyong Sun, Leo Grady, Chenyang Xu "A Multilevel Banded Graph Cuts Method for Fast Image Segmentation", Proc. of ICCV, Vol. 1, pp. 259–265, 2005.

29. Leo Grady, "Multilabel Random Walker Image Segmentation Using Prior Models", Proc. of CVPR, Vol. 1, pp. 763–770, 2005.

30. Leo Grady and Eric L. Schwartz. "Faster graph-theoretic image processing via small-world and quadtree topologies." Proc. of CVPR, pp. 360–365, 2004.

Other conferences, abstracts and technical reports:

1. Wei Li, Gianluca Paladini, Leo Grady, Timo Kohlberger, Vivek Singh and Claus Bahlmann, "Luggage Visualization and Virtual Unpacking", Workshop at SIGGRAPH Asia, 2012.

2. Noha El-Zehiry and Leo Grady, "Vessel Segmentation using 3D Elastica Regularization", Proc. ISBI 2012.

3. Daniel S. Weller, Jonathan R. Polimeni, Leo Grady, Lawrence L. Wald, Elfar Adalsteinsson and Vivek K. Goyal, "Greater Acceleration through Sparsity-Promoting GRAPPA Kernel Calibration", Accepted to ISMRM 2012.

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Intellectual property

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