LOK MING LUI

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EDUCATION

University of California at Los Angeles — Los Angeles, CA
Ph. D. in Applied Mathematics — *2003-2008*

University of California at Los Angeles — Los Angeles, CA
Master of Arts in Mathematics — *June 2005*

Hong Kong University of Science and Technology — Hong Kong, China
B. Sc. in Pure Mathematics — *June 2003*

WORK EXPERIENCE

- **Postdoctoral Scholar in Mathematics** Aug. 2008 - Now
  - Jointly appointed by Harvard University and University of California, Los Angeles
  - Hosted by: Prof. Shing-Tung Yau, Harvard and Prof. Tony F. Chan, UCLA
- **Visting Researcher, Microsoft Research Asia, Beijing** June 2007 - Sept. 2007.
  Research Mentor for the RIPS@Beijing Program. Mentoring two research projects:
  1. Hyperbolic Desktop; 2. Link Analysis of Google Page Rank.
- **Research Assistant, UCLA,**, Jan. 2005 - June 2008. Jointly working with Prof. Tony Chan, Prof. Paul M. Thomspon on:
  Brain Conformal Parametrization, Automatics sulcal landmarks tracking, PDEs/Variational Problem solving on Brain surfaces, Shape based Landmark matching diffeomorphism, Landmark matching diffeomorphism with the algebraic functions, Computational Differential Geometry.
- **Teaching Assistant, UCLA,** Sep. 2003 - Dec. 2004. Taught: Multivariable Calculus, Linear Algebra, Complex Analysis and Differential Geometry.
- **President and Cofounder, UCLA Student Chapter of Society of Industrial and Applied Mathematics (SIAM),** Sept. 2006 - Sept. 2007.

RESEARCH INTERESTS

Computational Conformal Geometry, Quasiconformal Geometry, Human Brain Mapping, Variational problems on manifolds and Surface Registration.

Thesis

- Title: "Computational Conformal Geometry and its Applications to Human Brain Mapping"
- Advisor: Prof. Tony F. Chan

My thesis develops mathematical algorithms and models to study human brain diseases, using conformal geometry as a tool. Effective methods have been developed to solve equations and variational problems on general manifolds using their Riemannian structures.

Publications

Journals

- **L.M. Lui, Y. Wang, T.F. Chan, and P.M. Thompson**, Brain Anatomical Feature Detection by Solving Partial Differential Equations on General Manifolds, Discrete and Continuous Dynamical Systems B, 7(3), May 2007, pp. 605-618
- **L.M. Lui, Y. Wang, T.F. Chan and P.M. Thompson**, Landmark Constrained Genus Zero Surface Conformal Mapping and Its Application to Brain Mapping Research", Applied Numerical Mathematics 57, 2007, pp. 847-858
- **L.M. Lui, Y. Wang, J. Kwan, and S. T. Yau**, Computation of Curvatures using Conformal Parameterization, Communications in Information and Systems, Volume 8, Number 1 (2008), 1-16.
- **Y. Wang, L. M. Lui, X. Gu, K.M. Hayashi, T.F. Chan, P.M. Thompson and S.-T. Yau**, Brain Surface Conformal Parameterization using Riemann Surface Structure, IEEE Transaction of Medical Imaging, 26(6), June 2007, pp. 853-865
- **L.M. Lui, X. Gu, T.F. Chan and S.-T. Yau**, Variational Method on Riemann Surfaces using Conformal Parameterization and its Applications to Image Processing, Journal of Methods and Applications of Analysis, Volume 15, Number 4 (2008), 513-538
- **W. Zhang, L.M. Lui, X. Gu , S.-T. Yau**, Shape Analysis by Conformal Modules, Journal of Methods and Applications of Analysis, Volume 15, Number 4 (2008), 539-556
- **L.M. Lui, Tsz Wai Wong, Wei Zeng, Xianfeng Gu, Paul Thompson, Tony Chan and Shing-Tung Yau**, Detecting Shape Deformations using Yamabe Flow and Beltrami Coefficents (in press), Journal of Inverse Problem and Imaging (IPI): Special Issue in Medical Imaging, Volume 3, Number 4, December (2009)
- **L.M. Lui, Sheshadri Thiruvenkadam, Y. Wang, Paul Thompson and Tony Chan**, Optimized Conformal Surface Registration with Shape-based Landmark Matching (in press), SIAM Journal of Imaging Sciences.

Proceedings

- **L.M. Lui, S. Thiruvenkadam, Y. Wang, T.F. Chan, P.M. Thompson**, Optimized Conformal Parameterization of Cortical Surfaces Using Shape Based Matching of Landmark Curves, International Conference on Medical Image Computing and Computer Assisted Intervention - MICCAI 2008, LNCS 5241, pp. 494-502
- **L.M. Lui, Y. Wang, T.F. Chan**, PDE on manifold using global conformal parametrization, Variational, Geometric, and Level Set Methods in Computer Vision: Third International Workshop, VLSM 2005, Beijing, China, Oct. 16, 2005, pp. 307-319
- **L. M. Lui, Y. Wang, T.F. Chan and P.M. Thompson**, Automatic Landmark Tracking and Its Application to the Optimization of Brain Conformal Mapping, IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), New York, NY, Jun. 2006
- **Y. Wang, L.M. Lui, T.F. Chan and P.M. Thompson**, Optimization of Brain Conformal Mapping with Landmarks, Proceedings of Medical Image Computing and Computer-Assisted Intervention - MICCAI 2005: 8th International Conference, Palm Springs, CA USA, Oct. 26-29, 2005, Part II, pp. 675-683
- **B. Gutman, Y. Wang, L. M. Lui, T. F. Chan, and P.M. Thompson**, Hippocampal Surface Analysis Using Spherical Harmonic Function Applied to Surface Conformal Mapping, Proceeding of 8th International Conference on Pattern Recognition (ICPR), Hong Kong, China, 2006, Vol. 3, pp. 964-967
- **B. Gutman, Y. Wang, L.M. Lui, T.F. Chan, P.M. Thompson**, Hippocampal Surface Discrimination via Invariant Descriptors of Spherical Conformal Maps, IEEE International Symposium on Biomedical Imaging - From Nano to Macro (ISBI), Washington D.C., USA, 2007, pp. 1316-1319

Submitted papers

- **Lok Ming Lui, Tsz Wai Wong, Xianfeng Gu, Tony Chan and Shing-Tung Yau**, Representation and Property Adjustments of Surface Diffeomorphism using Beltrami Holomorphic Flow, Communications in Mathematical Sciences

Presentation

- SIAM Conference on Imaging Science 2008 (IS08), San Diego, July 7-9
- International Conference on Medical Image Computing and Computer Assisted Intervention 2006, 9th International Conference, Copenhagen, Denmark, Oct. 1-6
- IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), New York, NY, Jun. 2006
- IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI), Arlington, VA, Apr. 2006
- International Conference on Medical Image Computing and Computer Assisted Intervention 2006 2005: 8th International Conference, Palm Springs, CA USA, Oct. 26-29, 2005
- The Eighth IASTED International Conference on Computer Graphics and Imaging (CGIM), Honolulu, HI, USA, Aug. 2005
- 11th Annual Meeting of the Organization for Human Brain Mapping (OHBM), Toronto, Canada, Jun. 12-16, 2005

Honors and Awards

- Phi Tau Phi Scholarship, April, 2007
- Charles E. and Sue K. Young Outstanding Graduate Student Award, UCLA College Award, March 2007
- Outstanding Leadership Award by Society of Industrial and Applied Mathematics 2007
- Research Assistantship, UCLA, Jan 2005 to Now
- Teaching Assistantship, UCLA, Sept 2003 to Dec 2004
- California Non-resident tuition Fellowship, UCLA, Sept 2003 to Now
- Academic Achievement Medal, Hong Kong University of Science and Technology 2003
- Deans list Award, Hong Kong University of Science and Technology (all semesters during the 3 years undergraduate study)
- Sir Edward Youde Scholarship 2002
- Heng Seng Bank Scholarship 2002
- Heung Tao Summer Research Scholarship 2002
- Heung Tao Student Exchange Program Scholarship 2002 (Exchanged to: University of California, Berkeley)

TEACHING EXPERIENCE

- **Teaching Assistant.** Advanced Calculus, Fall 2003, Winter 2004, Spring 2004, Winter 2008, UCLA.
- **Teaching Assistant.** Linear Algebra, Winter 2004, UCLA.
- **Teaching Assistant.** Complex Analysis, Spring 2004, UCLA.
- **Teaching Assistant.** Differential Geometry, Fall 2007, UCLA.

REFERENCES

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