

Bernard Chiu

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City University of Hong Kong
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CURRENT ACADEMIC APPOINTMENT

2011-Present Assistant Professor
Department of Electronic Engineering
City University of Hong Kong

EDUCATION/TRAINING

- 2009-2010** Senior Fellow
Vascular Imaging Laboratory
Department of Radiology, University of Washington, USA
Supervisor: Dr. William Kerwin
- 2004-2008** Ph.D.
Biomedical Engineering
University of Western Ontario, Canada
Thesis: Quantification of Carotid Atherosclerosis using 3D Ultrasound Images
Supervisor: Dr. Aaron Fenster
- 2001-2003** M.A.Sc.
Electrical and Computer Engineering
University of Waterloo, Canada
Thesis: A new segmentation algorithm for prostate boundary detection in 2D ultrasound images [[Download pdf](#)]
Supervisors: Drs. George H. Freeman and M.M.A. Salama
- 1996-2001** B.Sc.
Electrical Engineering
University of Calgary, Canada
Graduated with distinction
Participated in the Internship Program

PEER-REVIEWED PUBLICATIONS

1. Y. Chen[#] and **B. Chiu**, "Correspondence optimization in 2D standardized carotid wall thickness map by description length minimization: a tool for increasing reproducibility of 3D ultrasound-based measurements," *Med. Phys.*, submitted.
2. J. Cheng[#], D. Pike, T.W.S. Chow, M. Kirby, G. Parraga and **B. Chiu**, "Three-dimensional ultrasound measurements of carotid vessel wall and plaque thickness and their relationship with pulmonary abnormalities in ex-smokers without airflow limitation," *International Journal of Cardiovascular Imaging*, submitted.
3. W. Qiu, Y. Chen[#], J. Kishimoto, S. de Ribaupierre, **B. Chiu**, A. Fenster, J. Yuan, "Longitudinal analysis of pre-term neonatal cerebral ventricles from 3D ultrasound images using spatial-temporal deformable registration," *IEEE Trans. Med. Imag.*, submitted.

4. W. Qiu, Y. Chen[#], J. Kishimoto, S. de Ribaupierre, **B. Chiu**, A. Fenster, J. Yuan, “Automatic Segmentation Approach to Extracting Neonatal Cerebral Ventricles from 3D Ultrasound Images”, *Med. Image Anal.*, submitted.
5. Y. Yu[#], Y. Chen[#], **B. Chiu**, “Fully automatic prostate segmentation from transrectal ultrasound images based on radial bas-relief initialization and slice-based propagation,” *Computers in Biology and Medicine*, Vol. 74, pp. 74-90, 2016 [[Abstract](#)].
6. Y. Chen[#], G. Canton, W.S. Kerwin, **B. Chiu**, “Modelling hemodynamic forces in carotid artery based on local geometric features,” *Medical & Biological Engineering & Computing*, appeared online [[Abstract](#)].
7. Y. Chen[#], W. Qiu, J. Kishimoto, Y. Gao, R.H.M. Chan, S. de Ribaupierre, A. Fenster and **B. Chiu**, “A framework for quantification and visualization of segmentation accuracy and variability in 3D lateral ventricle ultrasound images of preterm neonates,” *Med. Phys.*, Vol. 42, No. 11, pp. 6387-6405, 2015 [[Abstract](#)].
8. E. Ukwatta, J. Yuan, W. Qiu, M. Rajchl, **B. Chiu**, A. Fenster, “Joint Segmentation of Lumen and Outer Wall from 3D Femoral Artery MR Images: Towards 3D Phenotypes of Peripheral Arterial Disease,” *Med. Image Anal.*, Vol. 26, Issue 1, pp. 120-132, 2015. [[Abstract](#)].
9. W. Qiu, J. Yuan, M. Rajchl, J. Kishimoto, Y. Chen[#], S. de Ribaupierre, **B. Chiu**, A. Fenster, “3D MR Ventricle Segmentation in Pre-Term Infants with Post-Hemorrhagic Ventricle Dilatation (PHVD) Using Multi-Phase Geodesic Level-Sets,” *NeuroImage*, Vol. 118, pp. 13-25, 2015 [[Abstract](#)].
10. W. Chen[#], J. Xu and **B. Chiu**, “Fast segmentation of the femoral arteries from 3D MR images: a tool for rapid assessment of peripheral arterial disease,” *Med. Phys.*, Vol. 42, No. 5, pp. 2431-2448, 2015. [[Abstract](#)] (One of the four highest quality articles in May 2015 issue (from ~ 50 articles) chosen by the editor to feature at the [Editor’s Picks Column](#) as Open-Access article).
11. Y. Yu[#], W. Qiu, **B. Chiu**, L. Sun, “Feasibility of multiple micro-particle trapping – a simulation study,” *Sensors*, Vol. 15, No. 3, pp. 4958-4974, 2015 [[Abstract](#)].
12. G. Canton, **B. Chiu**, H. Chen, Y. Chen, T. Hatsukami, W.S. Kerwin and C. Yuan, “A framework for the co-registration of hemodynamic forces and atherosclerotic plaque components,” *Physiol. Meas.*, Vol. 34, No. 9, pp. 977-990, 2013. (Shortlisted for the [Martin Black award for the best paper in 2013](#)) [[Abstract](#)]
13. **B. Chiu**, B. Li and T.W.S. Chow, “Novel 3D ultrasound image-based biomarkers based on feature selection from 2D standardized vessel wall thickness map: a tool for sensitive assessment of therapies for carotid atherosclerosis,” *Phys. Med. Biol.*, Vol. 58, No. 17, pp. 5959-5982, 2013. [[Abstract](#)]
14. **B. Chiu**, E. Ukwatta, S. Shavakh and A. Fenster, “Quantification and visualization of carotid segmentation accuracy and precision using a 2D standardized carotid map,” *Phys. Med. Biol.*, Vol. 58, No. 11, pp. 3671-3703, 2013. [[Abstract](#)]
15. E. Ukwatta, J. Yuan, D. Buchanan, **B. Chiu**, J. Awad, W. Qiu, G. Parraga and A. Fenster, “Three-dimensional segmentation of three-dimensional ultrasound carotid atherosclerosis using sparse field level sets,” *Med. Phys.*, Vol. 40, No. 5, 052903, 2013. [[Abstract](#)]
16. J. Chi^{*}, **B. Chiu**^{*}, Y. Cao, X. Liu, J. Wang, N. Balu, C. Yuan and J. Xu, “Assessment of femoral artery atherosclerosis at the adductor canal using 3D black-blood magnetic resonance imaging,” *Clin. Radiol.* Vol. 68, Issue 4, pp. e213–e221, 2013. [[Abstract](#)] ^{*}J. Chi and **B. Chiu** contributed equally to this paper.
17. **B. Chiu**, V. Shamdasani, R. Entekin, C. Yuan and W.S. Kerwin, “Characterization of carotid plaque in three-dimensional ultrasound by registration with multicontrast MRI,” *J Ultrasound Med.* Vol. 31, pp. 1567-1580, 2012. [[Abstract](#)]

18. **B. Chiu**, J. Sun, X. Zhao, J. Wang, N. Balu, J. Chi, J. Xu, C. Yuan and W.S. Kerwin, "Fast plaque burden assessment of the femoral artery using 3D black-blood MRI and automated segmentation." *Med. Phys.*, Vol. 38, No. 10, pp. 5370-5384, 2011. [[Abstract](#)]
19. **B. Chiu**, A. Krasinski, J.D. Spence, G. Parraga and A. Fenster, "Three-dimensional carotid ultrasound segmentation variability dependence on signal difference and boundary orientation" *Ultrasound Med. Biol.*, Vol. 36, No. 1, pp. 95-110, 2010. [[Abstract](#)]
20. A. Krasinski, **B. Chiu**, J.D. Spence, A. Fenster and G. Parraga, "Three-dimensional ultrasound quantification of intensive statin treatment of carotid atherosclerosis." *Ultrasound Med. Biol.*, Vol. 35, No. 11, pp. 1763-1772, 2009. [[Abstract](#)]
21. A. Krasinski, **B. Chiu**, A. Fenster and G. Parraga, "Magnetic resonance imaging and three-dimensional ultrasound of carotid atherosclerosis: Mapping regional differences." *J Magn Reson Imaging*, Vol. 29(4), pp. 901-908, 2009. [[Abstract](#)]
22. **B. Chiu**, V. Beletsky, J.D. Spence, G. Parraga and A. Fenster, "Analysis of carotid lumen surface morphology using 3-dimensional ultrasound imaging," *Phys. Med. Biol.*, Vol. 54, No. 5, pp. 1149-1167, 2009. [[Abstract](#)]
23. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu, G. Parraga and A. Fenster, "Nonrigid registration of three-dimensional ultrasound and magnetic resonance images of the carotid arteries," *Med. Phys.* Vol. 36, No. 2, pp. 373-385, 2009. [[Abstract](#)]
24. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga and A. Fenster, "Quantification of carotid vessel wall and plaque thickness change using 3D ultrasound images," *Med. Phys.* Vol. 35, No. 8, pp. 3691-3710, 2008. [[Abstract](#)]
25. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga and A. Fenster, "Area-preserving flattening maps of 3D ultrasound carotid arteries images," *Med. Image Anal.* Vol. 12, No. 6, pp. 676-688, 2008. [[Abstract](#)]
26. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga and A. Fenster, "Development of 3D ultrasound techniques for carotid artery disease assessment and monitoring," *International Journal of Computer Assisted Radiology and Surgery*, Vol. 3, Issue 1&2, pp. 1-10, 2008. [[Abstract](#)]
27. N. D. Nanayakkara, **B. Chiu**, A. Samani, J. D. Spence, J. Samarabandu and A. Fenster, "A 'Twisting and Bending' model-based nonrigid image registration technique for 3D ultrasound carotid images," *IEEE Trans. Med. Imag.*, Vol. 27, Issue 10, pp. 1378-1388, 2008. [[Abstract](#)]
28. M. Egger, **B. Chiu**, J.D. Spence, G. Parraga and A. Fenster, "Mapping spatial and temporal changes in carotid atherosclerosis using three-dimensional ultrasound images," *Ultrasound Med. Biol.*, Vol. 34, No. 1, pp. 64-72, 2008. [[Abstract](#)]
29. M. Ding, **B. Chiu**, I. Gyacskov, X. Yuan, M. Drangova, D.B. Downey and A. Fenster, "Fast prostate segmentation in 3D TRUS images based on continuity constraint using an autoregressive model," *Med. Phys.*, Vol. 34, No. 11, pp. 4109-4125, 2007. [[Abstract](#)]
30. W.Y. Song, **B. Chiu**, G.S. Bauman, M. Lock, G. Rodrigues, R. Ash, C. Lewis, A. Fenster, J.J. Battista and J. Van Dyk, "Prostate contouring uncertainty in mega-voltage computed tomography (MVCT) images acquired with a helical tomotherapy unit during image-guided radiation therapy (IGRT)," *Int. J. Radiation Oncology Biol. Phys.*, Vol. 65, No. 2, pp. 595-607, 2006. [[Abstract](#)]
31. **B. Chiu**, G.H. Freeman, M.M.A. Salama and A. Fenster, "Prostate segmentation algorithm using dyadic wavelet transform and discrete dynamic contour," *Phys. Med. Biol.*, Vol. 49, No. 21, pp. 4943-4960, 2004. [[Abstract](#)]

#: **B. Chiu's** Research Assistant/Ph.D. student.

 REFEREED CONFERENCE PROCEEDINGS

1. J. Cheng[#], W. Qiu, J. Yuan, A. Fenster, **B. Chiu**, “Accurate quantification of local changes for carotid arteries in 3D ultrasound images using convex optimization-based deformable registration”, Proc. SPIE 9784, Medical Imaging 2016: Image Processing, 978448, San Diego, USA, Feb. 27 - Mar. 3. [[Abstract](#)].
2. Y. Chen[#], J. Kishimoto, W. Qiu, S. de Ribaupierre, A. Fenster and **B. Chiu**, “Quantification of cerebral ventricle volume change of preterm neonates using 3D ultrasound images,” Proc. SPIE 9419, Medical Imaging 2015: Ultrasonic Imaging and Tomography, 94190V, Orlando, USA, Feb. 21-26, 2015 [[Abstract](#)].
3. W. Qiu, J. Yuan, J. Kishimoto, Y. Chen[#], S. de Ribaupierre, **B. Chiu** and A. Fenster, “3D MR ventricle segmentation in pre-term Infants with posthemorrhagic ventricle dilation,” , Proc. SPIE 9413, Medical Imaging 2015: Image Processing, 941310, Orlando, USA, Feb. 21-26, 2015 [[Abstract](#)].
4. Y. Yu[#], J. Cheng[#], J. Li[#], W. Chen[#] and **B. Chiu**, “Automatic prostate segmentation from transrectal ultrasound images,” Proc. of IEEE Biomedical Circuits and Systems Conference (BioCAS), Lausanne, Switzerland, Oct. 22-24, 2014, pp. 117-120. [[Abstract](#)]
5. E. Ukwatta, J. Yuan, W. Qiu, M. Rajchl, **B. Chiu**, S. Shavakh, J. Xu and A. Fenster, “Joint segmentation of 3D femoral lumen and outer wall surfaces from MR images” Proc. of 16th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), Nagoya, Japan, Sept. 22-26, 2013, pp. 534-541.
6. **B. Chiu**, Y. Chen[#], G. Canton and W.S. Kerwin, “Relationships between local geometrical features and hemodynamic flow properties,” Proc. of the 35th IEEE EMBS Annual International Conference, Osaka, Japan, Jul. 2-7, 2013, pp. 723-726. [[Abstract](#)]
7. **B. Chiu**, J. Sun, X. Zhao, J. Wang, N. Balu, J. Chi, J. Xu, C. Yuan and W.S. Kerwin, “Fast femoral artery segmentation from black-blood MRI” Proc. of the IEEE International Conference on Intelligent Computation and Biomedical Instrumentation (ICBIMI), Wuhan, China, Dec 14-17, 2011, pp. 136-139. [[Abstract](#)]
8. **B. Chiu**, N. Balu, L. Dong, X. Zhao, C. Yuan, W.S. Kerwin, “Optimal processing of isotropic 3D black-blood MRI for accurate estimation of vessel wall thickness,” Proc. of SPIE Vol. 7627, 76270J, 2010. [[Abstract](#)]
9. G. Canton, **B. Chiu**, C. Yuan, W.S. Kerwin, “Correlation of hemodynamic forces and atherosclerotic plaque components,” Proc. of SPIE Vol. 7625, 76250G, 2010. [[Abstract](#)]
10. N.D. Nanayakkara, **B. Chiu** and A. Fenster, “A surface-based metric for registration error quantification,” Proc. of the 4th International Conference on Industrial and Information Systems (ICIIS), Sri Lanka, Dec 28-31, 2009, pp. 349-353. [[Abstract](#)]
11. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga, A. Fenster, “Quantification of carotid arteries atherosclerosis using 3D ultrasound images and area-preserving flattened maps,” Proc. SPIE Vol. 6916, 691603, 2008. (Conference Finalists of the Michael B. Merickel Best Student Paper Awards.) [[Abstract](#)]
12. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu and A. Fenster, “Nonrigid registration of carotid ultrasound and MR images using a ‘Twisting and Bending’ model,” Proc. SPIE Vol. 6914, 691411, 2008. [[Abstract](#)]
13. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga and A. Fenster, “Quantification of progression and regression of carotid vessel atherosclerosis using 3D ultrasound images,” Proc. of the 28th IEEE EMBS Annual International Conference, New York City, USA, Aug 30-Sept 3, 2006, pp. 3819-3822. [[Abstract](#)]
14. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu, and A. Fenster, “A non-rigid image registration technique for 3D ultrasound carotid images using a ‘twisting and bending’ model,” Proc. of the 28th IEEE EMBS Annual International Conference, New York City, USA, Aug 30-Sept 3, 2006, pp. 2738-2741. [[Abstract](#)]

15. A. Fenster, **B. Chiu**, A. Landry, J.D. Spence and G. Parraga, "3D ultrasound system for analysis of carotid plaque progression and regression." Proceedings of the 40th Asilomar Conference on Signals, Systems, and Computers, Monterey, California, Oct. 29 - Nov. 1, 2006, pp. 1966-1970. [[Abstract](#)]
16. **B. Chiu**, M. Egger, J. D. Spence, G. Parraga and A. Fenster, "Quantification of carotid vessel atherosclerosis," Proc. SPIE Vol. 6143, 61430B, 2006. [[Abstract](#)]
17. A. Fenster and **B. Chiu**, "Evaluation of segmentation algorithms for medical imaging," Proc. of IEEE EMBC'05, Shanghai, China, Sept. 1-4, 2005, pp. 7186-7189. [[Abstract](#)]
18. **B. Chiu**, G.H. Freeman, M.M.A. Salama et al. "A segmentation algorithm using dyadic wavelet transform and discrete dynamic contour," Proc. of IEEE Canadian Conference on Electrical and Computer Engineering, 2003, Montreal, Canada, May 4 - 7, pp. 1481-1484. [[Abstract](#)]

#: **B. Chiu's** Research Assistant/Ph.D. student.

BOOK CHAPTERS

1. A. Fenster, G. Parraga, **B. Chiu** and E. Ukwatta. Three-Dimensional Ultrasound Imaging. In: Ultrasound Imaging and Therapy. pp. 39-63. A. Fenster, J.C. Lacefield (Eds.) ISBN: 978-1-4398-6628-3. CRC Press, New York: Mar. 2015.
2. A. Fenster, G. Parraga, **B. Chiu**, J. Bax. Three-dimensional ultrasound imaging. In: Handbook of 3D Machine Vision: Optical Metrology and Imaging. S. Zhang (Ed.) pp. 285-314. ISBN-13: 978-1-4398-7219-2. Taylor & Francis: Mar 2013. [[Abstract](#)]
3. **B. Chiu**, V. Beletsky, J.D. Spence, G. Parraga and A. Fenster. Carotid plaque surface irregularity. In: Ultrasound and Carotid Bifurcation Atherosclerosis. A. Nicolaides, K.W. Beach, E. Kyriakou, and C.S. Pattichis (Eds.) pp. 279-297. ISBN-13: 978-1848826878. Springer-Verlag, London: Jan. 2012. [[Abstract](#)]
4. A. Fenster, G. Parraga, A. Landry, **B. Chiu**, M. Egger, J.D. Spence. 3D ultrasound imaging of the carotid arteries. In: Advances in Diagnostic and Therapeutic Ultrasound Imaging. J.S. Suri, C. Kathuria, R-F. Chang, F. Molinari, A. Fenster (Eds.) pp. 67-92. ISBN-13: 978-1-59693-144-2. Artech House, Inc. Norwood, MA: July 2008.
5. G. Parraga, A. Fenster, A. Krasinski, **B. Chiu**, M. Egger and J.D. Spence. 3D carotid ultrasound imaging. In: Atherosclerosis Disease Management. J.S. Suri, C. Kathuria, F. Molinari (Eds.) pp. 325-350. ISBN-13: 978-1-4419-7221-7. Springer Science+Business Media, New York: Jan. 2011. [[Abstract](#)]
6. A. Fenster, G. Parraga, A. Krasinski, **B. Chiu**, M. Egger and J.D. Spence. 3D Carotid ultrasound imaging. In: Carotid Diseases: Diagnosis, Treatment and Management. J.S. Suri (Ed). American Scientific Publishers. In Press.

RESEARCH FUNDING

- Agency/Program: City University of Hong Kong, Strategic Research Grant (SRG)
 Project Title: *Prostate cancer detection using multi-parametric magnetic resonance imaging*
 Project Role: Principal Investigator
 Amount: HKD\$ 100,000
 Period: September 1, 2014 - February 29, 2016
- Agency/Program: Shenzhen Science and Technology Innovation Committee, China, Shenzhen Supplementary Grant
 Project Title: *Development and generation of carotid atlases for quantitative and localized monitoring and assessment of carotid artery disease*
 Project Role: Principal Investigator
 Amount: CNY\$ 50,000
 Period: March 1, 2014 -
- Agency/Program: University Grants Committee, Hong Kong, Early Career Scheme
 Project Title: *Development and validation of novel biomarkers for carotid atherosclerosis quantification and monitoring using a carotid atlas*
 Project Role: Principal Investigator
 Amount: HKD\$ 595,100
 Period: January 1, 2014 - December 31, 2016
- Agency/Program: National Natural Science Foundation of China
 Project Title: *Development and generation of carotid atlases for quantitative and localized monitoring and assessment of carotid artery disease*
 Project Role: Principal Investigator
 Amount: CNY\$ 230,000
 Period: January 1, 2013 - December 31, 2015
- Agency/Program: City University of Hong Kong, Strategic Research Grant (SRG)
 Project Title: *Development and generation of carotid atlases for quantitative evaluation of carotid atherosclerosis*
 Project Role: Principal Investigator
 Amount: HKD\$ 100,000
 Period: October 1, 2012 - September 30, 2013
- Agency/Program: Shanghai Renji Hospital, Contract Research Project
 Project Title: *Assessment of carotid atherosclerosis and its relationship with ischemic vascular disease using magnetic resonance imaging*
 Project Role: Principal Investigator
 Amount: CNY\$ 60,000
 Period: July 16, 2012 - July 16, 2014
- Agency/Program: City University of Hong Kong, Strategic Research Grant (SRG)
 Project Title: *Relationships between carotid artery geometry and hemodynamic flow properties*
 Project Role: Principal Investigator
 Amount: HKD\$ 180,000
 Period: May 1, 2012 - October 31, 2014
- Agency/Program: City University of Hong Kong, Startup Grant
 Project Title: *Fast femoral artery assessment using 3D black-blood MRI and automatic segmentation*
 Project Role: Principal Investigator
 Amount: HKD\$ 200,000
 Period: June 1, 2011 - November 30, 2013

SUPERVISION

Post-doctoral Fellow

2012-Present Weifu Chen, PhD

Graduate Student Supervision

Date	Name	Degree	Department/University
2012-Present	Yimin Chen	PhD	Electronic Engineering, City University of Hong Kong
2013-Present	Jieyu Cheng	PhD	Electronic Engineering, City University of Hong Kong
2013-Present	Yanyan Yu	PhD	Electronic Engineering, City University of Hong Kong
2015-Present	Mingquan Lin	PhD	Electronic Engineering, City University of Hong Kong

PRESENTATIONS

1. **B. Chiu**, “Quantification of atherosclerosis using carotid vessel wall imaging,” Presented in Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China: Dec. 12, 2014 (Invited by Dr. Weibao Qiu).
2. **B. Chiu**, “3D ultrasound system to investigate intraventricular hemorrhage in preterm neonates,” Presented in Department of Paediatrics, Chinese University of Hong Kong: Oct. 29, 2014 (Invited by Prof. Pak Cheung Ng).
3. **B. Chiu**, “Development of sensitive 3D ultrasound-based biomarkers for carotid atherosclerosis assessment and monitoring,” Presented in International Workshop on Medical Ultrasound Diagnosis and Treatment, Huazhong University of Science and Technology, Wuhan, China: Nov. 1, 2013 (Invited by Prof. Mingyue Ding).
4. **B. Chiu**, “Quantification of atherosclerosis using carotid vessel wall imaging,” Presented in Medical Ultrasound Laboratory, Huazhong University of Science and Technology, Wuhan, China: Mar. 31, 2013 (Invited by Prof. Mingyue Ding).
5. **B. Chiu**, “3D Vessel-Wall-Plus-Plaque Thickness (VWT) as a novel biomarker of atherosclerosis,” Presented in City University of Hong Kong for visitors from Yonsei University, Seoul, Korea: Jan. 19, 2012.
6. **B. Chiu**, “Quantification of atherosclerosis using vessel wall imaging,” Presented in School of Mathematics and Computing, Sun Yat-Sen University, Guangzhou, China: Jan. 5, 2012 (Invited by Dr. Guocan Feng, Associate Head).
7. **B. Chiu**, “Fast femoral artery segmentation from black-blood MRI” Presented at IEEE International Conference on Intelligent Computation and Biomedical Instrumentation (ICBIMI). Wuhan, China: Dec 15, 2011.
8. **B. Chiu**, “Quantification of atherosclerosis using carotid vessel wall imaging,” Presented in Department of Electrical and Electronic Engineering, Division of Engineering, University of Nottingham Ningbo, China: Nov. 10, 2011 (Invited by Dr. David Siu-Yeung Cho).
9. **B. Chiu**, “Computation, visualization and analysis of vessel wall thickness using 3D ultrasound and MR images,” Presented in Department of Information Science & Electronic Engineering, Zhejiang University, Hangzhou, China: Apr. 1, 2011 (Invited by Dr. Ying Liu).
10. **B. Chiu**, “Plaque burden assessment of the femoral artery using 3D Black-blood MRI and automated segmentation,” Presented in Renji Hospital, Shanghai Jiao Tong University, Shanghai, China: Mar. 29, 2011 (Invited by Dr. Jianrong Xu).
11. **B. Chiu**, “Quantification of atherosclerosis using carotid vessel wall imaging,” Presented in Department of Biomedical Engineering, Tsinghua University, Beijing, China: Oct. 26, 2010 (Invited by Dr. Xihai Zhao).

12. **B. Chiu**, “Quantification of atherosclerosis using carotid vessel wall imaging,” Presented in Department of Electronic Engineering, City University of Hong Kong, Hong Kong: Oct. 19, 2010 (Invited by Dr. K. F. Man, Department Head).
13. **B. Chiu**, V. Beletsky, J.D. Spence, G. Parraga and A. Fenster, “Analysis of carotid lumen surface morphology using three-dimensional ultrasound imaging,” Presented at American Institute of Ultrasound in Medicine (AIUM), 2010 Annual Convention. San Diego, CA: Mar. 25, 2010.
14. **B. Chiu**, N. Balu, L. Dong, X. Zhao, C. Yuan, W.S. Kerwin, “Optimal processing of isotropic 3D black-blood MRI for accurate estimation of vessel wall thickness,” Presented at SPIE Medical Imaging. San Diego, CA: Feb. 17, 2010.
15. **B. Chiu**, “Quantification of Carotid Atherosclerosis using 3D Ultrasound Images,” Ph.D. Public Lecture, University of Western Ontario, London, ON, Canada: Nov. 17, 2008.
16. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga and A. Fenster, “Quantification of Carotid Atherosclerosis using 3D Ultrasound Images,” Presented at the Imaging Network Ontario 7th Annual Imaging Symposium (ImNO), Toronto, Ontario, Canada: Sep. 29, 2008 (Invited).
17. **B. Chiu**, “Quantification of Carotid Atherosclerosis using 3D Ultrasound Images,” Presented at Vascular Imaging Laboratories, University of Washington, Seattle, WA: Jul. 11, 2008 (Invited by Drs. Chun Yuan and William Kerwin.)
18. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga and A. Fenster, “Quantification of carotid arteries atherosclerosis using 3D ultrasound images and area-preserving flattened maps,” Presented at SPIE Medical Imaging. San Diego, CA: Feb. 17, 2008.
19. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu and A. Fenster, “Nonrigid registration of carotid ultrasound and MR images using a ‘Twisting and Bending’ model,” Presented at SPIE Medical Imaging. San Diego, CA: Feb. 18, 2008.
20. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga, A. Fenster, “Quantification of carotid vessel atherosclerosis using 3D ultrasound images,” Presented at Joint Annual Scientific Meeting, Canadian Association of Radiation Oncology & Canadian Organization of Medical Physicists (CARO & COMP), Sheraton Centre Hotel, Toronto, Ontario: Oct. 12, 2007.
21. **B. Chiu**, “Quantification of carotid arteries atherosclerosis using 3D ultrasound images and area-preserving flattened maps.” Presented at the Biomedical Engineering Graduate Seminar Series, The University of Western Ontario, London, ON: Oct. 9, 2007.
22. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu, and A. Fenster, “A non-rigid registration technique for 3D ultrasound images using a ‘Twisting and Bending’ model to monitor carotid plaque changes,” Presented at the Imaging Network Ontario 6th Annual Imaging Symposium (ImNO), Toronto, Ontario, Canada, Mar. 28-29, 2007.
23. **B. Chiu**, “Quantification of carotid vessel wall and plaque thickness change using 3D ultrasound images.” Presented at the Dept. of Electronic & Computer Engineering, Hong Kong University of Science and Technology, Hong Kong: Jan. 5, 2007 (Invited by Dr. Pengcheng Shi.)
24. **B. Chiu**, “Quantification of carotid vessel wall and plaque thickness change using 3D ultrasound images.” Presented at the Biomedical Engineering Graduate Seminar Series, The University of Western Ontario, London, ON: Oct. 26, 2006.
25. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga and A. Fenster, “Quantification of carotid vessel atherosclerosis.” Presented at SPIE International Symposium, Medical Imaging. San Diego, CA: Feb. 11-16, 2006.
26. A. Fenster, **B. Chiu**. “Evaluation of segmentation algorithms for medical imaging.” Presented at 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC). Shanghai International Convention Centre, Shanghai, China. Sep. 1-4, 2005 (Invited).

27. **B. Chiu**, "Surface analysis of manual or semi-automatic segmentations from 3D ultrasound images." Presented at the OCITS Retreat, Robarts Research Institute, London, ON: Jul. 5, 2005.
28. **B. Chiu**, "Quantification of progression or regression of atherosclerosis at the carotid vessel." Presented at the Biomedical Engineering Graduate Seminar Series, The University of Western Ontario, London, ON: Mar. 16, 2005.
29. **B. Chiu**, "A segmentation algorithm using dyadic wavelet transform and discrete dynamic contour." Presented at the IEEE Canadian Conference on Electrical and Computer Engineering, Montreal, Canada, May 4-7, 2003.
30. **B. Chiu**, "Automatic segmentation algorithm using dyadic wavelet transform and discrete dynamic contour." M.A.Sc. seminar, University of Waterloo, Waterloo, ON: Mar. 3, 2003.

ABSTRACTS

1. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga and A. Fenster, "Quantification of carotid vessel atherosclerosis." 1st Canadian Student Conference on Biomedical Computing, Kingston, Ontario, Poster# 110.
2. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu and A. Fenster, "A biomechanical model based non-rigid image registration technique for 3D ultrasound carotid images," 1st Canadian Student Conference on Biomedical Computing, Kingston, Ontario, Poster# 104.
3. M. Egger, **B. Chiu**, J.D. Spence, A. Fenster, G. Parraga "A novel non-invasive 3D ultrasound imaging phenotype of carotid atherosclerosis." London Imaging Discovery Forum (LID). London Convention Centre, London, Ontario: June 17, 2006.
4. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu, A. Fenster "Non-rigid registration of 3D ultrasound carotid images using a "Twisting and Bending" model." Proceedings of the Imaging Network Ontario 5th Annual Imaging Symposium (ImNO). p. 142. Toronto, ON: Apr. 3-4, 2006.
5. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga and A. Fenster, "Validation of a novel quantification method for carotid atherosclerosis." Margaret P. Moffat Graduate Research Day, Great Hall, Somerville House, The University of Western Ontario, London, Ontario: May 9, 2006, Poster# 78.
6. M. Egger, **B. Chiu**, J. D. Spence, A. Fenster and G. Parraga, "A Novel Non-Invasive 3D Ultrasound Imaging Phenotype of Carotid Atherosclerosis." The 52nd Annual Scientific Meeting of the Canadian Organization of Medical Physicists. Delta Bessborough Hotel, Saskatoon, Saskatchewan. *Med. Phys.* 33(7). pp. 2663-2664. May 31-June 3, 2006. [[Abstract](#)]
7. W. Song, **B. Chiu**, G. Bauman, M. Lock, G. Rodrigues, R. Ash, C. Lewis, A. Fenster, J. Battista, J. Van Dyk "Prostate contouring uncertainty in mega-voltage computed tomography (MVCT) images acquired with a helical tomotherapy unit during image-guided radiation therapy (IGRT)." American Association of Physicists in Medicine (AAPM) 48th Annual Meeting. Orange County Convention Center, Orlando, FL. *Med. Phys.* 33(6). p. 1977. July 30-August 3, 2006. [[Abstract](#)]
8. A. Krasinski, M. Egger, **B. Chiu**, S. McKay, J.D. Spence, A. Fenster, G. Parraga, "3-dimensional ultrasound carotid atherosclerosis vessel wall thickness maps: localized changes after intensive statin treatment." Robarts Research Day, Robarts Research Institute, London, Ontario: Feb. 7, 2007, Poster# 12.
9. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga and A. Fenster, "Quantification of carotid vessel atherosclerosis using 3D ultrasound images" 2nd Canadian Student Conference on Biomedical Computing, London, Ontario: Mar. 16-18, 2007, Poster# 5.
10. A. Krasinski, M. Egger, **B. Chiu**, S. McKay, J.D. Spence, A. Fenster, G. Parraga, "3D ultrasound carotid atherosclerosis vessel wall thickness maps: localized changes after intensive statin treatment." 2nd Canadian Student Conference on Biomedical Computing, London, Ontario: Mar. 16-18, 2007, Poster# 12.

11. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu and A. Fenster, "A non-rigid registration technique for 3D ultrasound images using a "twisting and bending" model to monitor carotid plaque changes." 2nd Canadian Student Conference on Biomedical Computing, London, Ontario: Mar. 16-18, 2007, Poster# 22.
12. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu and A. Fenster, "A non-rigid registration technique for 3D ultrasound images using a "twisting and bending" model to monitor carotid plaque changes." Margaret P. Moffat Graduate Research Day, Great Hall, Somerville House, The University of Western Ontario, London, Ontario: Mar. 22, 2007, Poster# 13.
13. A. Krasinski, M. Egger, **B. Chiu**, S. McKay, J.D. Spence, A. Fenster, G. Parraga, "Carotid 3D ultrasound atherosclerotic plaque and vessel wall thickness maps: localized changes after intensive statin treatment." Margaret P. Moffat Graduate Research Day, Great Hall, Somerville House, The University of Western Ontario, London, Ontario: Mar. 22, 2007, Poster# 21.
14. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga and A. Fenster, "Quantification of changes in carotid atherosclerosis by 3-Dimensional ultrasound images." Proceedings of the Imaging Network Ontario 6th Annual Imaging Symposium (ImNO). p. 25, Toronto, ON: Mar. 28-29, 2007.
15. A. Krasinski, M. Egger, **B. Chiu**, S. McKay, J.D. Spence, A. Fenster, G. Parraga, "Carotid atherosclerotic plaque and vessel wall thickness maps: detecting localized changes." Proceedings of the Imaging Network Ontario 6th Annual Imaging Symposium (ImNO). p. 62. Toronto, ON: Mar. 28-29, 2007.
16. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu, A. Fenster "Non-rigid registration technique for 3D ultrasound images using a "Twisting and Bending" model to monitor carotid plaque changes." Proceedings of the Imaging Network Ontario 6th Annual Imaging Symposium (ImNO). p. 77. Toronto, ON: Mar. 28-29, 2007.
17. A. Krasinski, M. Egger, **B. Chiu**, S. McKay, J.D. Spence, A. Fenster, G. Parraga, "Carotid 3-dimensional Ultrasound Atherosclerotic Plaque and Vessel Wall Thickness Maps: Location-specific Changes After Intensive Statin Treatment." Arteriosclerosis, Thrombosis, and Vascular Biology Annual Conference 2007, Apr. 19-21, 2007, Chicago, Illinois, Poster# 373.
18. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga, A. Fenster, "Quantification of carotid vessel atherosclerosis using 3D ultrasound images." London Imaging Discovery Forum (LID). London Convention Centre, London, Ontario: June 16, 2007, Poster# 6.
19. A. Krasinski, M. Egger, **B. Chiu**, S. McKay, J.D. Spence, A. Fenster, G. Parraga, "Carotid 3-dimensional ultrasound atherosclerotic plaque and vessel wall thickness maps: localized changes after intensive statin treatment." London Imaging Discovery Forum (LID). London Convention Centre, London, Ontario: June 16, 2007, Poster# 21.
20. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu, A. Fenster "A Non-Rigid registration technique for 3D ultrasound images using a 'Twisting and Bending' model to monitor carotid plaque changes." London Imaging Discovery Forum (LID). London Convention Centre, London, Ontario: June 16, 2007, Poster# 29.
21. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga, A. Fenster, "Quantification of carotid arteries atherosclerosis using 3D ultrasound images." Biomedical Imaging and Computer Vision (BICV) Symposium. University of Waterloo, Waterloo, Ontario: Sep. 27, 2007. Poster# 106.
22. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu and A. Fenster, "A non-rigid registration technique for 3D ultrasound images using a 'Twisting and Bending' model to monitor carotid plaque changes." Biomedical Imaging and Computer Vision (BICV) Symposium. University of Waterloo, Waterloo, Ontario: Sep. 27, 2007. Poster# 205.
23. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga, A. Fenster, "Quantification of carotid vessel atherosclerosis using 3D ultrasound images," Joint Annual Scientific Meeting, Canadian Association of Radiation Oncology & Canadian Organization of Medical Physicists (CARO & COMP), Sheraton Centre Hotel, Toronto, Ontario: *Radiother. Oncol.*, Vol. 84, Supplement 2. p. S19. Oct. 9-13, 2007.

24. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, J. Samarabandu, A. Fenster, “Non-rigid registration of 3D ultrasound images to monitor carotid plaque changes,” Joint Annual Scientific Meeting, Canadian Association of Radiation Oncology & Canadian Organization of Medical Physicists (CARO & COMP), Sheraton Centre Hotel, Toronto, Ontario: *Radiother. Oncol.*, Vol. 84, Supplement 2. p. S77. Oct. 9-13, 2007.
25. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga, A. Fenster, “Quantification of carotid vessel atherosclerosis using 3D ultrasound images,” Margaret P. Moffat Graduate Research Day, Great Hall, Somerville House, The University of Western Ontario, London, Ontario: Mar. 20, 2008, Poster# 31.
26. A. Krasinski, **B. Chiu**, B. Rutt, A. Fenster, G. Parraga, “Comparison of 3D ultrasound and MRI carotid artery maps,” Margaret P. Moffat Graduate Research Day, Great Hall, Somerville House, The University of Western Ontario, London, Ontario: Mar. 20, 2008, Poster# 109.
27. A. Krasinski, **B. Chiu**, T. Wade, B. Rutt, A. Fenster, G. Parraga, “Mapping carotid atherosclerosis using MRI and 3D ultrasound,” Robarts Research Day, Robarts Research Institute, London, Ontario: Mar. 27, 2008, Poster# 20.
28. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga, A. Fenster, “Quantification of carotid vessel atherosclerosis using 3D ultrasound images,” Canadian Institute of Health Research (CIHR) Institute of Circulatory and Respiratory Health (ICRH) Young Investigators Forum, Le Centre Sheraton, Montreal, Quebec: May 8-10, 2008. Poster# 76.
29. N.D. Nanayakkara, **B. Chiu**, A. Samani, J.D. Spence, G. Parraga, J. Samarabandu, A. Fenster, “Non-rigid registration of 3D ultrasound and MR carotid images,” Canadian Institute of Health Research (CIHR) Institute of Circulatory and Respiratory Health (ICRH) Young Investigators Forum, Le Centre Sheraton, Montreal, Quebec: May 8-10, 2008. Poster# 71.
30. **B. Chiu**, A. Krasinski, J.D. Spence, A. Fenster and G. Parraga, “Computational mapping of carotid atherosclerosis: Demonstration of vessel wall thickness using 3D ultrasound and MRI,” In: “Cardiac and vascular imaging”. *International Journal of Computer Assisted Radiology and Surgery*. Published online: May 17, 2008. [[Abstract](#)]
31. **B. Chiu**, M. Egger, J.D. Spence, G. Parraga, A. Fenster, “Quantification of Carotid Atherosclerosis using 3D Ultrasound Images,” Proceedings of the Imaging Network Ontario, 7th Annual Imaging Symposium (ImNO). p. 14. Toronto, ON: Sep. 29 - Oct. 1, 2008.
32. G. Canton, **B. Chiu**, H. Chen, L. Dong, W. S. Kerwin and C. Yuan, “Hemodynamics and vascular biology: Modeling flow effects with MRI and computational fluid dynamics,” 4th Annual South Lake Union Group poster show, University of Washington, WA, USA: May 28, 2009. Poster# 29.
33. **B. Chiu**, V. Beletsky, J.D. Spence, G. Parraga and A. Fenster, “Analysis of carotid lumen surface morphology using three-dimensional ultrasound imaging,” American Institute of Ultrasound in Medicine (AIUM), 2010 Annual Convention, San Diego, California: Mar. 24-27, 2010. *J. Ultrasound Med.* 29(3) (Supplement). p. S19-20.
34. **B. Chiu**, X. Zhao, J. Wang, N. Balu, C. Yuan and W.S. Kerwin, “Fast plaque burden assessment of the femoral artery using 3D black-blood MRI and automated segmentation,” ISMRM 2010, Stockholm, Sweden: May 1-7, 2010. #3731 (E-poster presentation).
35. G. Canton, **B. Chiu**, T. Hatsukami, W. S. Kerwin and C. Yuan, “Wall shear stress as a stimulus for carotid atherosclerotic plaque progression: An MRI-based CFD pilot study,” 63rd Annual Meeting of the APS Division of Fluid Dynamics, Long Beach, California: Nov. 21-23, 2010.
36. **B. Chiu**, V. Shamdasani, R. Entrekin, C. Yuan and W.S. Kerwin, “Characterization of carotid plaque in three-dimensional ultrasound by registration with multicontrast MRI,” Proc. of 19th Intl. Soc. Mag. Reson. Med. (ISMRM), p. 1186. Montreal, Quebec, Canada: May 7-13, 2011. [[Abstract](#)]

TEACHING ACTIVITIES

- 2011-Present** **Instructor in EE2004: Microcomputer Systems**
City University of Hong Kong, Hong Kong
- 2014-Present** **Instructor in EE3919: Medical Imaging and Signal Processing**
City University of Hong Kong, Hong Kong
- 2012** **Instructor in EE3273: Design Laboratory**
City University of Hong Kong, Hong Kong
- 2005-2008** **Teaching assistant in ES036: Programming Fundamentals (5 terms)**
University of Western Ontario, London, Canada
- Supervised student laboratory sessions
 - Marked student programming assignments and mid-term examinations.
- 2007** **Teaching assistant in BME519: Advanced Medical Imaging, Processing, Analysis**
University of Western Ontario, London, Canada
- Gave two lectures in Visualization Toolkit (VTK).
 - Marked MATLAB assignments in image registration and segmentation.
- 2005** **Teaching assistant in ECE375: Microcontroller and Microcomputer**
University of Western Ontario, London, Canada
- Supervised student laboratory sessions and marked laboratory reports.
- 2002** **Teaching assistant in ECE413: Digital Signal Processing**
University of Waterloo, Canada
- Organized and documented the solutions of all assignments and examinations.
 - Explained the assignment solutions during weekly tutorial.
 - Marked mid-term and final examinations.

PROFESSIONAL ACTIVITIES

Journal editor

- Editorial Review Board Member, Journal of Biomedical Engineering and Informatics, 2015-present.
- Editor, Advances in Radiology, 2013-present.
- Associate editor, Medical Physics, 2013.

Journal reviewer

- Ultrasonics
- International Journal of Molecular Sciences
- IEEE Transactions on Industrial Informatics
- Mathematical Problems in Engineering
- Journal of Clinical Ultrasound
- Vascular Health and Risk Management
- Medical Engineering & Physics
- International Journal of Computer Assisted Radiology and Surgery
- IEEE Transactions on Medical Imaging

- Medical Image Analysis
- Stroke
- BioMedical Engineering OnLine

Other activities

- Technical program committee member, 2013 IEEE International Conference on Signal Processing, Communications and Computing (ICSPCC 2013).
- Chair, “Image denoising, retrieval and assessment” session, IEEE International Conference on Intelligent Computation and Biomedical Instrumentation (ICBBI), Wuhan, China, Dec. 15, 2011.
- Speaker, IEEE EMBS Tour of Robarts Research Institute, organized by University of Western Ontario EMBS Student Branch, Mar. 18, 2008.
- Expert reviewer, The 10th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2007.
- Chair, “Image-guided intervention” session, 2nd Canadian Student Conference on Biomedical Computing, The University of Western Ontario, London, Ontario, Mar. 17, 2007.
- Executive committee member and reviewer, 2nd Canadian Student Conference on Biomedical Computing, The University of Western Ontario, London, Ontario, 2007.
- Expert reviewer, 1st Canadian Student Conference on Biomedical Computing, Queen’s University, Kingston, Ontario, 2006.

SCHOLARSHIPS AND AWARDS

- Travel award, Canadian Institute of Health Research (CIHR) Institute of Circulatory and Respiratory Health’s (ICRH) Young Investigators Forum, May 8-10, 2008, Montreal, Quebec.
- Conference Finalists of the Michael B. Merickel Best Student Paper Awards, SPIE Medical Imaging 2008, San Diego, USA.
- Delegate, Dragon 100 Young Chinese Leaders Forum - 2007 study trip.
- Ontario Graduate Scholarships (2002-2003, 2005-2006, 2006-2007, 2007-2008)
- CIHR Strategic Training Fellows (2004-2006)
- Faculty of Engineering Entrance Fund Scholarships (University of Waterloo) (2001-2002)
- University of Waterloo Graduate Scholarship (2002)
- Student Peer Assistance Undergraduate Bursaries (University of Calgary) (1997, 1998, 2000)
- Talisman Energy Bursary (University of Calgary) (1997)