

Brent J. Liu

1/27/2016

## CURRICULUM VITAE

### A. PERSONAL INFORMATION

Name in Full	<b>Brent J Liu, Ph.D.</b>
Current Business Address	Department of Biomedical Engineering 1042 Downey Way, DRB-264 Los Angeles, CA 90089-1111
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### B. EDUCATION

High School	Schurr High School, Montebello, CA, 1986
University	University of California, Los Angeles, CA, B.S., Electrical Engineering, 1990
Graduate School	University of California, Los Angeles, CA, Ph.D., Biomedical Physics, 1996
Post Doctoral Fellowship	University of California at Los Angeles, CA, Medical Imaging & Informatics, 1996-1999
Honors and Awards	<i>Certificate of Merit</i> Award, RSNA1998 for Scientific Exhibit: "Diagnostic Reading Protocols for a Neuroradiology Workstation", Chicago, IL, 1998  <i>Certificate of Merit</i> Award, RSNA2001 for Educational Exhibit: "PACS Archive Upgrade and Data Migration: Clinical Experiences", Chicago, IL, 2001  <i>Certificate of Merit</i> Award, RSNA2003 for Inforad Exhibit: "Control of Image Workflow Using Wireless PDAs", Chicago, IL, 2003  <i>Certificate of Merit</i> Award, RSNA2004 for Inforad Exhibit: "The Data Storage Grid: The Next Generation of Fault-Tolerant Storage for Backup and Disaster Recovery of Clinical Images", Chicago, IL, 2004

**C. PROFESSIONAL BACKGROUND**

**Academic Appointments:**

Associate Professor of Research, Department of Biomedical Engineering, Viterbi School of Engineering, USC, April 2010 – present.

Assistant Professor of Research, USC Keck School of Medicine, Department of Radiology, USC Viterbi School of Engineering, Department of Biomedical Engineering, Los Angeles, CA., May 1, 2003 to April 2010.

Postdoctoral Fellow, University of California at Los Angeles, Medical Imaging & Informatics, Los Angeles, CA, 1996-1999

Honorary Lectureship, Hong Kong Polytechnic University, Hong Kong, China, 2003.

**Specific Teaching Responsibility:**

BME Instructor for two graduate courses in Biomedical Engineering Department, BME 527 & BME 528 2004-Present.

Special Guest Lecture on Medical Imaging Informatics for School of Pharmacy Graduate, Course PSCI 599, Part of the BISI headed by Prof. Walter Wolf, Spring 2006.

Teach classes for graduate students in medical image processing, Biomedical Physics Graduate Program, University of California at Los Angeles, 1996-1999

Teach Workshop courses in PACS (Picture Archiving and Communication Systems) Implementation, and Acceptance Testing Design/Development at the Hong Kong Polytechnic University, 2003

**Specific Administrative Responsibilities:**

Director, Image Processing and Informatics Laboratory (IPILab)  
Steering Committee Member, CTSA Initiative, Biomedical Informatics,  
Biostatistics and Research Ethics Design Team Member, CTSA Initiative

**Other:**

### **Professional PACS Appointments and Experience**

#### **Director of Special Projects and PACS System Administrator, Saint John's Health Center, (Manufacturer Experience including GE, Siemens, Cedara, Stentor, and Fuji PAC systems) Santa Monica, CA, 1999-2002**

- Responsible for the integration, implementation, and support of a full-scale filmless PACS system at Saint John's Health Center, a high profile Community Hospital, including workflow/training/support.
- Involved in the planning/implementation/integration of all Imaging-related systems including RIS, Nuclear Medicine PACS, and Radiation Oncology Treatment Planning systems.
- Managed a three-member team to provide support and training of the PACS.

#### **PACS Implementation Manager, University of California, Los Angeles, CA 2002-2003**

- Responsible for managing the integration and implementation of a full-scale filmless PACS system at the UCLA Health Care campuses in Westwood and Santa Monica including workflow/training/support.
- Involved in the planning/implementation/integration of all Imaging-related systems including RIS, Nuclear Medicine PACS, Radiation Oncology systems, and Cardiology Imaging systems.
- Managed an eight-member team to plan the PACS implementation process.

#### **PACS Advisor, University of Southern California Healthcare Consultation Center II, Los Angeles, CA, 2003-present**

- Participated in an Advisory role for the entire PACS process including Contract Negotiations, Implementation Planning and Strategy, Training, Workflow, Go-Live, and Support. HCCII is a high-profile Outpatient Facility with US, CR, CT, MR and solely operated by the Department of Radiology.
- Managed a five-member IT team to provide planning, strategy, and support for the PACS.

#### **PACS Advisor, Washoe Health Center, Reno, NV, 2001-2002**

- Participated in an Advisory role for the PACS process including Implementation Planning and Strategy, Training, Workflow and Go-Live. Washoe Health Center is a Level II Trauma Center with 355 beds.
- Designed, Developed, and Performed the Acceptance Test for the PACS installation

#### **PACS Advisor, Saint John's Health Center, Santa Monica, CA, 2002-present**

- Participate as an Advisory Role for Post PACS implementation system stability, and Future Vision of PACS and RIS.

#### **PACS Advisor, Overlake Hospital, Bellevue, WA, 2002-present**

- Participated in an Advisory role for the PACS process including Implementation Planning and Strategy, Training, Workflow and Go-Live. Overlake Hospital is a Level III Trauma Center with 337 beds, which also includes two separate Outpatient Facilities both with US, CR, MR, CT, and PET.
- Designed, Developed, and Performed the Acceptance Test for the PACS installation.

**D. SOCIETY MEMBERSHIPS**

**Professional:**

- Society Photo-Optical Instrumentation Engineers, 2003 - Present
- Radiological Society of North America, 2003 - Present

**E. SERVICE**

**Professional Organizations:**

**National**

1. Co-Chair, SPIE Medical Imaging Conference, PACS and Imaging Informatics, 2012
2. Co-Chair, SPIE Medical Imaging Conference, PACS and Imaging Informatics, 2011
3. Co-Chair, SPIE Medical Imaging Conference, PACS and Imaging Informatics, 2010
4. Co-Chair, SPIE Medical Imaging Conference, PACS and Imaging Informatics, 2009
5. Chairman of Session for SPIE Conference: Medical Imaging 2008.
6. Chairman of Session for SPIE Conference: Medical Imaging 2007.
7. Chairman of Session for SPIE Conference: Medical Imaging 2006.
8. Chairman of Session for SPIE Conference: Medical Imaging 2005.
9. Chairman of Session for SPIE Conference: Medical Imaging 2004.
10. Chairman of Session for SPIE Conference: Medical Imaging 2003.
11. Chairman of Session for SPIE Conference: Medical Imaging 2002.

**Other:**

**Consultantships**

- Research Consultant, IPI Laboratory, Children's Hospital Los Angeles/USC, 1999-2003
- Reviewer for *IEEE Trans Med Imaging*, 2000-Present
- Consultant, Reliance Healthcare, Inc., 2000 – Present

## F. **RESEARCH ACTIVITIES**

### **Major Areas of Research Interest:**

Medical Imaging Informatics, Picture Archiving and Communication Systems. PACS clinical uptime and usability, new PACS technology, Disaster Recovery for clinical PACS, design and implementation of high-resolution image display workstations, next generation Internet and its clinical applications, and advances in the area of image processing and information management for healthcare.

### **Research Grants:**

1. Medical Image/Data Security Assurance Using Digital Envelope, R01 LM07606, NLM/NIH, Investigator (PI: H.K. Huang), 2003-2006, Medical Images security is an important issue when digital images and their pertinent patient information are transmitted across public networks. The research project is to study the current data encryption technologies, and to design and develop an infrastructure of deploying the security standards in a hospital PACS environment. (12% FTE) \$2,250,000  
(Direct+Ind)
2. Digital Hand Atlas in Assessment of Skeletal Development, R01 EB00298, NIBIB/NIH, Investigator (PI: H.K. Huang), 2004-2008, The research project is to develop a large-scale digital hand atlas with a computer-assisted diagnostic (CAD) server supporting automated and Web-based bone age assessment for pediatric cases from age 0-18. Current bone age assessment is performed in the clinical environment using an outdated book containing images from a select group of children fifty years ago. (30% FTE) \$1,375,803  
(Direct+Ind)
3. Summer Undergraduate Research Program, 22-2149-6044, USC, PI: Brent J. Liu, Summer 2004, This grant is to fund potential undergraduate students interested in performing Medical Imaging Informatics Research during the summer. (30% FTE) \$10,000

4. Summer Undergraduate Research Program, 22-2149-6044, USC, PI: Brent J. Liu, Summer 2005, This grant is to fund potential undergraduate students interested in performing Medical Imaging Informatics Research during the summer. (30% FTE) \$5,000
5. Summer Undergraduate Research Program, 22-2149-6044, USC, PI: Brent J. Liu, Summer 2006, This grant is to fund potential undergraduate students interested in performing Medical Imaging Informatics Research during the summer. (30% FTE) \$9,000
6. Summer Undergraduate Research Program, 22-2149-6044, USC, PI: Brent J. Liu, Summer 2007, This grant is to fund potential undergraduate students interested in performing Medical Imaging Informatics Research during the summer. (30% FTE) \$6,000
7. Summer Undergraduate Research Program, 22-2149-6044, USC, PI: Brent J. Liu, Summer 2008, This grant is to fund potential undergraduate students interested in performing Medical Imaging Informatics Research during the summer. (30% FTE) \$9,000
8. USC Wright Foundation Research Award, 23-5149-4292, Wright Foundation, PI: Brent J. Liu, 2005-2007 A DICOM-RT ePR System for Managing Brain Tumor Patients, The project is to research and develop an electronic patient record for imaging and informatics data of cancer patients with brain tumors undergoing radiation therapy. (30% FTE) \$50,000
9. Development of a Novel Imaging and Informatics Platform for Translational Small Animal and Molecular Imaging Research, USC CTSI Pilot and Feasibility Grant Program, Core Resource, PI: Brent J. Liu, July 2008 – July 2009, The project is to develop imaging and informatics toolkits to allow for basic research science to be performed in the molecular imaging center for small animals. (20% FTE) \$20,000
10. Use of Ultrasound for Image-Guided Surgery, 22-1508-1500, James H. Zumberge Research and Innovation \$50,000

Fund, co-PI (PI: Jesse Yen) July 2007- July 2009, The project is a collaboration of three teams of expertise to develop an Ultrasonic navigational device for image-guided surgery. (10% FTE)

11. Cancer Bioinformatics Grid (caBIG) In Vivo Imaging Workspace Participant, 53-5149-0540, NCI/NIH, PI: Brent J. Liu, 2005-2006, This contract was to help develop an Imaging workspace within the caBIG infrastructure and identify project needs within the workspace to be funded in the future. (30% FTE) \$45,000
12. T32 Biomedical Imaging Informatics Training Program, T32 EB00438, NIBIB/NIH, Investigator (PI: H.K. Huang) Sep 2005-Sep 2010, This five year training program is to draw candidates from the BME, MD/PhD, and Residency programs who want to perform translational research in Medical Imaging Informatics. (5% FTE) \$1,600,000 (Direct+Ind)
13. DOD USAMRMC/TATRC/HMJF Development of Unique Advanced Medical Research and Development Initiatives in the Western United States and Pacific Rim, Proton Beam Therapy Innovations, Phase I Subaward, 0000138722, USAMRMC/HMJF, PI: Brent J. Liu, Jan 2007 - Dec 2008, The project is to research and develop an electronic patient record of imaging and informatics data for cancer patients undergoing Proton Therapy treatment. (10% FTE) \$147,099 (Direct+Ind)
14. DOD USAMRMC/TATRC/HMJF Development of Unique Advanced Medical Research and Development Initiatives in the Western United States and Pacific Rim, Proton Beam Therapy Innovations, Phase II Subaward, W81XWH-04-2-0025, USAMRMC/HMJF, PI: Brent J. Liu, Dec 2008 - Dec 2009, The project is to investigate and develop extensions to the electronic patient record of imaging and informatics data for cancer patients undergoing Proton Therapy treatment including imaging informatics tools and built-in decision support . (25% FTE) \$100,000 (Direct+Ind)
15. DOD USAMRMC/TATRC Advanced Medical Technology Initiative (AAMTI) Remote Computer-Aided Diagnosis of Acute Intracranial Hemorrhage in the Timely Evaluation of TBI, Subaward, 2007011185, \$120,000 (Direct+Ind)

- USAMRMC/TATRC, co-PI, (PI: H.K. Huang), Dec 2008 - Dec 2009, The project is to research and develop a CAD system for timely diagnosis of Acute Intracranial Hemorrhage (AIH) in critical environments. (10% FTE)
16. (10% salary support 1/12 – 12/12), PI, Brent J Liu; (25% RA support 5/12 – 12/12) BME PhD student Sneha Verma, “Radiation Medicine Central Nervous System Studies Phase II, Subcontract”, DOD/TATRC/LLU, Grant Number: W81XWH-11-2-0151, Grant Period: 01/01/12 – 08/30/14, PI-Brent Liu \$169,759 (Dir+Ind)
17. (12.5% salary support 7/12 – 12/12), Investigator, Brent J Liu; (25% RA support 8/12-12/12) BME PhD student Ximing Wang, “Optimizing Participation Through Technologies (OPTT) - RERC for Successful Aging With Disability”, DOE/NIDRR, Grant Number: H133E080024, Grant Period: 10/01/2008 - 09/30/2013, PI-Carolee Winstein \$4,750,000 (Dir+Ind)
18. (25% RA support 1/12 – 7/12) BME PhD student Ximing Wang, “Optimizing the Dose of Rehabilitation After Stroke” Clinical Trial, NIH/NIHCD, Grant Number: R01HD065438, Total Funding Amount:, Grant Period: 01/01/11 – 12/30/15, PI-Carolee Winstein \$1,062,500 (Dir+Ind)
19. (49% Non-USC support 1/12 – 7/12), Investigator, Brent J Liu; (25% RA support 3/12- 12/12) BME PhD student Ruchi Deshpande, “VA Caregivers Rural Health”, VA Long Beach Hospital/LAREI Grant Number: 2135000, Grant Period: 07/01/11 – 07/01/13, PI-Sophia Chun \$499,899 (Dir+Ind)
20. (50% Non-USC support 8/12 – 12/12), Investigator, Brent J Liu, “Intergovernmental Personnel Act – VA Long Beach Health Care System”, VALB, Grant Number: 54-4508-4361, Grant Period: 08/01/12 – 07/30/13, PI-Brent Liu \$79,911 (Dir)
21. (50% Non-USC support), Investigator, Brent J Liu, “Intergovernmental Personnel Act – VA Long Beach Health Care System”, VALB, Grant Number: 54-4508-4361, Grant Period: 08/01/13 – 07/30/14, PI-Brent Liu \$58,134 (Dir)



## BIBLIOGRAPHY

### PEER REVIEW

1. **Liu BJ**, Chuang KS: A Cluster Merging Filter for Noise Smoothing. *IEEE Engineering in Medicine and Biology Magazine* 13(2):249-262, April/May 1994.
2. **Liu BJ**, Cao F, Zhou Z, Mogel G, Documet L, Trends in PACS Image Storage and Archive, *Computerized Medical Imaging and Graphics*, 27:165-174, 2003.
3. **Liu BJ**, Huang HK, Cao F, Zhou MZ, Zhang J, Mogel GT, A Complete Continuous-Availability PACS Archive Server Solution, *Radiographics*, 1203-1209, 2004.
4. Huang HK, **Liu BJ**, Zhou MZ, Huang HK, A Continuous Available (CA) Server for Medical Imaging Applications, *Journal of Academic Radiology* V.11, No.7, pp. 767-778, 2004.
5. **Liu BJ**, Zhou Z, Documet J, Zhang A, Mogel G, Utilizing Data Grid Architecture for the Backup and Recovery of Clinical Image Data, *Computerized Medical Imaging and Graphics*. 29:95-102, 2005.
6. \*Zhou Z, **Liu BJ**, HIPAA Compliant Auditing System for Medical Images, *Computerized Medical Imaging and Graphics*. 29:235-241, 2005.
7. **Liu BJ**, Living With PACS, Part 1: Implementation Strategy, *The Hong Kong Radiographers Journal*, V.9, No. 1, pp. 10-15, June 2005.
8. **Liu BJ**, Living With PACS, Part 2: Acceptance and Testing Methodology, *The Hong Kong Radiographers Journal*, V.9, No. 1, pp. 16-20, June 2005.
9. **Liu BJ**, Zhou Z, Huang HK, A HIPAA-compliant Architecture for Securing Clinical Images, *Journal of Digital Imaging*, V. 19, No. 2, pp. 172-180, June 2006.
10. \*Documet J, **Liu BJ**, Huang HK, Documet L, Wireless Remote Control of Clinical Image Workflow: Utilizing a PDA for Offsite Distribution and Disaster Recovery, *Journal of American College of Radiology*, V. 3, No. 7, pp. 520-527, July 2006.
11. \*King N, Documet J, **Liu BJ**, Predicting Clinical Image Delivery Time by Monitoring PACS Queue Behavior, *Journal of Digital Imaging*, V. 19, Supp. 1, pp. 35-43, Dec 2006.
12. \*Gertych A, Pietka E, Liu BJ, Segmentation of regions of interest and post-segmentation edge for location improvement in computer-aided bone age assessment, *Pattern Analysis and Applications*, V. 10, No. 2, pp. 115-223, 2006.

13. **Liu BJ**, Zhou Z, Gutierrez MA, Documet J, Chan L, Huang HK, International Internet2 Connectivity and Performance in Medical Imaging Applications: Bridging the Americas to Asia, *J High Speed Network*, V. 16, No. 1, pp. 5-20, 2007.
14. \*Zhou Z, Gutierrez MA, Documet J, Chan L, Huang HK, **Liu BJ**, The Role of a Data Grid in Worldwide Imaging-Based Clinical Trials, *J High Speed Networks*, V. 16, No. 1, pp. 21-33, 2007.
15. \*Guo B, **Liu BJ**, Documet J, Lee J, King N, Shrestha R, Wang K, Huang HK, Grant EG, Experiences with a Prototype Tracking & Verification System Implemented within an Imaging Center, *Journal of Academic Radiology*, V. 14, No. 3, pp. 270-278, 2007.
16. **Liu BJ**, Law YY, Documet J, Gertych A, Image-Assisted Knowledge Discovery and Decision Support in Radiation Therapy Planning, *Computerized Medical Imaging and Graphics*, 31:4-5, pp. 311-321, 2007.
17. \*Zhou Z, **Liu BJ**, Le A, CAD-PACS Integration Tool Kit Based on DICOM Secondary Capture, Structured Report and IHE Workflow Profiles, , *Computerized Medical Imaging and Graphics*, 31:4-5, pp. 346-352, 2007.
18. \*Zhang A, Gertych A, **Liu BJ**, Automatic Bone Age Assessment for Young Children from Newborn to 7-Year-Old Using Carpal Bones, *Computerized Medical Imaging and Graphics*, 31:4-5, pp. 311-321, 299-310, 2007.
19. Huang HK, **Liu BJ**, Zhou Z, Documet J, A Data Grid Model for Combining Teleradiology and PACS Operations, *Journal of Medical Imaging Technology*, V. 25, No. 1, pp. 7-12, 2007.
20. **Liu BJ**, A Knowledge-Based Imaging Informatics Approach for Managing Proton Beam Therapy Treatment of Cancer Patients, *Technology in Cancer Research and Treatment*, V. 6, No. 4 Supplement, pp. 77-84, 2007.
21. \*Zhang A, Sayre J, Vachon L, **Liu BJ**, Huang HK, Cross-racial Discrepancies of Growth Patterns in Bone Age Assessment using the Greulich and Pyle Atlas, *Radiology*, V. 290, No. 1, pp. 228-235, 2009.
22. Law, MYY, **Liu BJ**, DICOM-RT and its Utilization in Radiation Therapy. *Radiographics* V.29, No.3, pp. 655-667, 2009.
23. Law, MYY, **Liu BJ**, Chan WC, An ePR-based Radiation Therapy Information System Utilizing the DICOM-RT Standard. *Radiographics*, V.29, No. 4, pp. 961-972, 2009.
24. \*Le AHT, **Liu BJ**, Huang HK, Integration of Computer-aided Diagnosis/Detection (CAD) Results in a PACS Environment using CAD-PACS Toolkit and DICOM SR.

*International Journal of Computer Assisted Radiology and Surgery*, V.4 , No.4, pp317-329, 2009.

25. \*Documet J, Le A, **Liu BJ**, Chiu J, Huang HK, A multimedia Electronic Patient Record (ePR) system for Image-Assisted Minimally Invasive Spinal Surgery. *International Journal of Computer Assisted Radiology and Surgery*, V. 5, No.3, pp195-209, May 2010.
26. Chiu J, Maziad A, Rappard G, Thacker J, **Liu BJ**, Documet J, Evolving Minimally Invasive Spine Surgery: A Surgeon's Perspective on Technological Convergence and Digital OR Control System. *Surgical Technology International XIX Orthopaedic Surgery*, 2010.
27. \*Lee J, Documet J, **Liu BJ**, Park R, Tank A, Huang HK, MIDG-Emerging Grid Technologies for Multi-site Preclinical Molecular Imaging Research Communities. *International Journal of Computer Assisted Radiology and Surgery*, V. 6, No.2, pp285-296, March 2011.
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31. **Liu, B.**, The Role of Imaging Informatics in Clinical Translational Research: Perspectives and Challenges from a US Academic Institution, *Journal of Translational Medicine*, V. 10, Suppl 2, A27, October 2012.
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33. Zhang X, Xin G, **Liu BJ**, Wen Y, Long L, Huang Y, Fujita H. Effective staging of fibrosis by the selected texture features of liver: Which one is better, CT or MR imaging?. *Journal of Computerized Imaging and Graphics, Special Issue on Information Technologies in Biomedicine*, [doi:10.1016/j.compmedimag.2015.09.003](https://doi.org/10.1016/j.compmedimag.2015.09.003).

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35. \*Garrison KA, Rogalsky C, Sheng T, Liu BJ, Damasio H, Winstein CJ, Aziz-Zadeh LS. Functional MRI preprocessing in lesioned brains: manual versus automated region of interest analysis *Frontiers in Neurology*, [dx.doi.org/10.3389/fneur.2015.00196](https://dx.doi.org/10.3389/fneur.2015.00196).
36. \*Ma KC, Fernandez JR, Amezcua L, Lerner A, Shiroishi MS, **Liu BJ**. Design and development of an ethnically-diverse imaging informatics-based eFolder system for multiple sclerosis patients. *Computerized medical imaging and graphics : the official journal of the Computerized Medical Imaging Society*. 2015;46 Pt 2:257-68.
37. Deshpande R, DeMarco J, Sayre J, **Liu BJ** (2016) Knowledge Driven Decision Support for Assessing Dose Distributions in Radiation Therapy of Head and Neck Cancer. *Int J Comput Assist Radiol Surg* (Review/Revision Ongoing)

\* Indicates Trainees, Mentorees, or Graduate Students.

## BOOK CHAPTERS

1. Huang HK, Cao F, Zhang J, **Liu BJ**, Tsai ML, Fault tolerant picture archiving and communication system and teleradiology design, Chapter 8, in *Security Issues in the Digital Medical Enterprise*, Editor: Bruce I. Reiner et al., Society for Computer Applications in Radiology, SCAR University Primer, Vol. I: 57-64, November 2000.
2. **Liu BJ**, Image Assisted Knowledge Discovery and Decision Support in Radiation Therapy Planning, *Principles and Advanced Methods in Medical Imaging and Image Analysis* AP Dhawan, HK Huang, and DS Kim, Ed., Chapter 22, pp. 545-572, World Scientific Publications, Singapore, 2008.
3. **Liu BJ**, Huang HK, Principles of X-Ray Anatomical Imaging Modalities, *Principles and Advanced Methods in Medical Imaging and Image Analysis* AP Dhawan, HK Huang, and DS Kim, Ed., Chapter 3, pp. 29-62, World Scientific Publications, Singapore, 2008.
4. \*Zhou Z, Huang HK, **Liu BJ**, Lossless Digital Signature Embedding Methods for Assuring 2D and 3D Medical Image Integrity, *Principles and Advanced Methods in Medical Imaging and Image Analysis* AP Dhawan, HK Huang, and DS Kim, Ed., Chapter 23, pp. 573-598, World Scientific Publications, Singapore, 2008.
5. Huang HK, Zhou Z, **Liu BJ**, Grid Methods for Large Scale Medical Image Archiving and Analysis, *Principles and Advanced Methods in Medical Imaging and Image Analysis*

AP Dhawan, HK Huang, and DS Kim, Ed., Chapter 21, pp. 517-544, World Scientific Publications, Singapore, 2008.

6. **Liu BJ**, Huang HK, PACS and Medical Imaging Informatics for Filmless Hospitals, *Biomedical Information Technology*, David Dagan Feng, Ed., Chapter 13, pp. 279-306, Elsevier, Oxford, 2008.
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## CONFERENCE PROCEEDINGS

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2. Verma SK, Liu BJ, Gridley DS, Mao XW, Kotha N (2015) An Imaging Informatics-Based System to Support Animal Studies For Treating Pain in Spinal Cord Injury Utilizing Proton Beam Radiotherapy. Proc. SPIE 9418, Medical Imaging 2015: PACS and Imaging Informatics: Next Generation and Innovations, 941811; doi: 10.1117/12.2081550.
3. Wang X, Edwardson M, Dromerick A, Winstein C, Wang J, Liu BJ (2015) Characterizing stroke lesions using digital templates and computer-aided lesion quantification tools in a web-based imaging informatics system for a large-scale stroke rehabilitation clinical trial. Proc. SPIE 9418, Medical Imaging 2015: PACS and Imaging Informatics: Next Generation and Innovations, 94180E; doi:10.1117/12.2082735.
4. Ma KC, Wang X, Lerner A, Shiroishi M, Amezcua L, Liu BJ (2015) Big data in multiple sclerosis: development of a web-based longitudinal study viewer in an imaging informatics-based eFolder system for complex data analysis and management. Proc. SPIE 9418, Medical Imaging 2015: PACS and Imaging Informatics: Next Generation and Innovations, 941809; doi: 10.1117/12.2082650.
5. Wang, X., Martinez, C., Wang, J., Liu, Y., **Liu, B.J.**, Development of a user customizable imaging informatics-based intelligent workflow engine system to enhance rehabilitation clinical trials. Proc. SPIE 9039, Medical Imaging 2014: PACS and Imaging Informatics: Next Generation and Innovations, 90390G (19 March 2014); doi: 10.1117/12.2044411.

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7. Deshpande, R., Thuptimchang, W., DeMarco, J., **Liu, B.J.**, A collaborative framework for contributing DICOM RT PHI (Protected Health Information) to augment data mining in clinical decision support. Proc. SPIE 9039, Medical Imaging 2014: PACS and Imaging Informatics: Next Generation and Innovations, 90390K (19 March 2014); doi: 10.1117/12.2044010.
8. Ma, K., Wong, J., Zhong, H., Zhang, J., **Liu, B.J.**, Development of a web-based DICOM-SR viewer for CAD data of multiple sclerosis lesions in an imaging informatics-based efolder. Proc. SPIE 9039, Medical Imaging 2014: PACS and Imaging Informatics: Next Generation and Innovations, 903903 (19 March 2014); doi: 10.1117/12.2044076.
9. Verma, S., **Liu, B.J.**, Chun, S., Gridley, D.S., An imaging informatics-based system utilizing DICOM objects for treating pain in spinal cord injury patients utilizing proton beam radiotherapy. Proc. SPIE 9039, Medical Imaging 2014: PACS and Imaging Informatics: Next Generation and Innovations, 90390W (19 March 2014); doi: 10.1117/12.2044433.
10. Deshpande, R., Zhou, A., Zhang J., DeMarco, J., **Liu, B.J.**, Role of an imaging informatics-based DICOM-RT cancer registry in evaluating treatment parameters of IMRT for prostate cancer. Proc. SPIE 8674, Medical Imaging 2013: Advanced PACS-based Imaging Informatics and Therapeutic Applications, 86740O (March 29, 2013); doi:10.1117/12.2007429.
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## PRESENTATIONS

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2. Ma, K, Wang, X, Shiroishi, MS, Lerner, A, Amezcua, L, **Liu, BJ**, Big data in multiple sclerosis analysis: data mining and analysis using a web-based longitudinal study viewer in an imaging informatics-based eFolder system. Radiological Society of North America 2014 Scientific Assembly and Annual Meeting, November 29 - December 4, 2014, Chicago IL.
3. Deshpande, R, DeMarco, J, **Liu, BJ**, Moving towards Big Data Analytics in Radiation Therapy: Dynamic Decision Support through Data Mining. Radiological Society of North America 2014 Scientific Assembly and Annual Meeting, November 29 - December 4, 2014, Chicago IL
4. **Liu, B**, Deshpande, R, Documet, J, Thuptimrang, W, Demarco, J, Kupelian, P, Low, D, An Open Source, Rich-client Web Application for Visualizing DICOM RT Data. Radiological Society of North America 2013 Scientific Assembly and Annual Meeting, December 1 - December 6, 2013, Chicago IL
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