

## Bradley M. Hemminger Publications

### Publications

#### **Books**

Hemminger BM, Digital Display of Radiological Images, Ponsen & Looijen, Amsterdam Netherlands, 2001.

#### **Book Chapters**

Pizer SM, Hemminger BM, Johnston RE, "Chapter 5: Display, Including Enhancement of Two-Dimensional Images", Image Processing Techniques for Tumor Detection, editor Strickland RN, Marcel-Decker, New York, 2002, pp101-130.

Behlen FM, Hemminger BM, Horri SC, "Chapter 10: Displays," SPIE Medical Imaging Handbook: PACS, editor Horri SC, Bellingham WA, SPIE, pp403-440, 2000.

Hemminger BM, Mukherji SK, "3D Visualization of the Extracranial Head and Neck," in Modern Head and Neck Imaging, Mukherji SK, Castelijns JA (eds), Heidelberg Springer-Verlag, 1998: 193-200.

Mukherji, SK, Shelton C, Hemminger BM, Harnsberger RH, "Advances in Temporal Bone Imaging," Advances in Otolaryngology Head and Neck Surgery, 1997.

#### **Refereed Journal Publications**

Hemminger BM, Long T, Saelim B, "Comparison of Visualization Techniques for Displaying Medication History to Older Adults", JAMIA, p1-25, submitted January 2007.

Vaughan KTL, Hemminger BM, Pulley M, "Scientists Comment on Their Libraries: Successes, Shortcomings, and Dreams for the Future", College and Research Libraries, p1-13, submitted December 2006.

Hemminger BM, Saelim B, Sullivan PF, Vision TJ, "Comparison of Full-text Searching to Metadata Searching for Genes in Two Biomedical Literature Cohorts", JASIST, p1-23, accepted, in press 2007.

Hemminger BM, Lu D, Vaughan KTL, Adam SJ, "Information Seeking Behavior of Academic Scientists", JASIST, p1-22, accepted, in press 2007.

Hemminger BM, Bauers A, Yang J, "Comparison of Navigation Techniques for Large Digital Images", ACM Transactions on Computer Human Interactions, p1-18, submitted Oct 2005.

Hemminger BM, Saelim B, and Sullivan PF, "TAMAL: an integrated approach to choosing SNPs for genetic studies of human complex traits", DOI 10.1093/bioinformatics/btk025, Bioinformatics 22: 626-627, 2006.

Hemminger BM, Losi T, Bauers A, "Survey of Bioinformatics Programs in the United States", JASIST, Vol 56, No 5: 529-537 2005.

Hemminger BM, Molina PL, Egan, TM, Detterbeck RC, Muller KE, Coffey C, Lee JKT, "Assessment of Real-Time 3D Visualization for Cardiothoracic Diagnostic Evaluation and Surgery Planning", Journal of Digital Imaging, Vol 18, No 2, pp145-153, 2005.

Hemminger BM, Gerald Bolas, Doug Schiff, "Capturing Content for Virtual Museums: from Pieces to Exhibits", Journal of Digital Information, Vol 6, Issue 1, Article No. 313, p1-14, March 2005.

Samei, E., Badano, A., Chakraborty, D., Compton, K., Cornelius, C., Corrigan, K., Flynn, M.J., Hemminger, B., Hangiandreou, N., Johnson, J., Moxley-Stevens, D.M., Pavlicek, W., Roehrig, H., Rutz, L., Samei, E., Shepard, J., Uzenoff, R.A., Wang, J., Willis, C.E.. Assessment of display performance for medical imaging systems: Executive summary of AAPM TG18 report. Medical Physics, 32(4), 1205-1225, 2005.

Hemminger B.M. Softcopy Display Requirements for Digital Mammography. Journal of Digital Imaging, Sep;16(3):292-305, 2003.

Pisano ED, Cole EB, Kistner EO, Muller KE, Hemminger BM, Brown ML, Johnston RE, Kuzmiak CM, Braeuning MP, Freimanis RI, Soo MS, Baker JA, Walsh R., "Interpretation of Digital Mammograms: A Comparison of Speed and Accuracy of Soft-Copy Versus Printed-Film Display. Radiology, 2002; 223: 483-488.

Hemminger BM, Zong S, Muller KE, Coffey CS, DeLuca MC, Johnston RE, Pisano ED, "Improving the Detection of Simulated Masses in Mammograms through two Different Image-Processing Techniques", Academic Radiology, 2001; 8:845-855.

Pisano ED, Cole EB, Major S, Zong S, Hemminger BM, Muller KE, Johnston RE, Walsh R, Conant E, Fajardo LL, Feig SA, Nishikawa RM, Yaffe MJ, Williams MB, Aylward SR, Braeuning MP, McLelland R, Pizer SM, Brown ME, Rosen E, Soo MS, Williford M, Niklason LT, Maidment ADA, Vermont A, Kornguth PJ, Kopans DB, Moore RH, Chakraborty D, Jong R, Shumak R, Staiger M, Plewes DB, "Radiologists' Preferences for Digital Mammographic Display," Radiology, 2000; 216 (3): 820-830.

Pisano ED, Cole EB, Hemminger BM, Yaffe MJ, etal, "Image Processing Algorithms for Digital Mammography: A Pictorial Essay," Radiographics 20:1479-1491, May 2000.

Pisano ED, Yaffe M, Hemminger BM, Hendrick E, Niklason L, etal, "Current Status of Full-Field Digital Mammography," Academic Radiology, 7:266-280, March 2000.

Hemminger BM, Dillon AW, Johnston RE, Muller KE, Deluca MC, Coffey CS, Pisano ED, "Effect of display luminance on the feature detection rates of masses in mammograms," Medical Physics, 26 (11), Nov 1999, pp 2266-2272.

Shtern F, Winfield DW, Behlen F, Blume H, Flynn MJ, Hemminger BM, Huang HK, Krupinski EA, Kundel H, Roehrig H, Shile PE, Sickles E, "Report of Working Group on Digital Mammography: Digital Displays and Workstation Design," Academic Radiology, Vol 6, Supplement 4, April 1999, pp 197-218.

Pisano ED, Zong S, Hemminger BM, DeLuca M, Johnston RE, Muller K, Braeuning MP, Pizer SM, "Contrast limited adaptive histogram equalization image processing to improve the detection of simulated spiculations in dense mammograms," Journal of Digital Imaging, 11(4):193-200, 1998 Nov.

Pisano ED, Chandramouli J, Hemminger BM, Glueck D, Johnston RE, Muller K, Braeuning MP, Puff D, Garrett W, Pizer S, "The effect of intensity windowing on the detection of simulated masses embedded in dense portions of digitized mammograms in a laboratory setting," Journal of Digital Imaging, 10(4):174-82, 1997 Nov.

Blume H, Hemminger BM, "Image Presentation in Digital Radiology: Perspectives on the Emerging DICOM Display Function Standard and Its Application," Radiographics, Vol 17, No 3, pp 769-777, May 1997.

Pisano ED, Chandramouli J, Hemminger BM, DeLuca M, Glueck D, Johnston RE, Muller K, Braeuning MP, Pizer S, "Does intensity windowing improve the detection of simulated calcifications in dense mammograms?," Journal of Digital Imaging, 10(2):79-84, 1997 May.

Beard DV, Hemminger BM, Remote ultrasound using cooperative video: a field study. Journal of Behaviour and Information Technology. Vol 17, No 3, pp 10-17, January 1, 1998.

Beard DV, Molina PL, Muller KE, Denelsbeck KM, Hemminger BM, Perry JR, Braeuning MP, Glueck DH, Bidgood WD Jr, Mauro M, et al., "Interpretation time of serial chest CT examinations with stacked-metaphor workstation versus film alternator," Radiology, 197(3):753-8, 1995 Dec.

Hemminger BM, Johnston RE, Rolland JR, Muller KE, "Introduction to Perceptual Linearization for Video Display Systems for Medical Image Presentation," Journal of Digital Imaging, Vol 8, No 1, Feb. 1995, pp:21-34.

Puff DT, Pisano ED, Muller KE, Johnston RE, Hemminger BM, Burbeck CA, McLelland R, Pizer SM, "A Method for Determination of Optimal Image Enhancement for the Detection of Mammographic Abnormalities," Journal of Digital Imaging: 161-171 Nov 1994.

Beard DV, Hemminger BM, Pisano ED, Denelsbeck KM, Warshauer DM, Mauro MA, Keefe B, McCartney WH, Wilcox CB, "Computed tomography interpretations with a low-cost workstation: a timing study," Journal of Digital Imaging, 7(3):133-9, 1994 Aug.

Beard DV, Hemminger BM, Denelsbeck KM, Johnston RE, "How many screens does a CT workstation need?," Journal of Digital Imaging, 7(2):69-76, 1994 May.

Beard DV, Hemminger BM, Keefe B, Mittelstaedt C, Pisano ED, Lee JK, "Real-time radiologist review of remote ultrasound using low-cost video and voice," *Investigative Radiology*, 28(8):732-4, 1993 Aug.

Beard DV, Hemminger BM, Perry JR, Mauro MA, Muller KE, Warshauer DM, Smith MA, Zito AJ, "Interpretation of CT studies: single-screen workstation versus film alternator," *Radiology* 187(2):565-9, 1993 May.

Hemminger BM, Johnston RE, Rolland JR, Muller KE, "Introduction to Perceptual Linearization for Video Display Systems for Medical Image Presentation," *Journal of Digital Imaging*, Vol 8, No 1, Feb. 1995, pp:21-34.

Puff DT, Pisano ED, Muller KE, Johnston RE, Hemminger BM, Burbeck CA, McLelland R, Pizer SM, "A Method for Determination of Optimal Image Enhancement for the Detection of Mammographic Abnormalities," *Journal of Digital Imaging*: 161-171 Nov 1994.

Beard DV, Hemminger BM, Pisano ED, Denelsbeck KM, Warshauer DM, Mauro MA, Keefe B, McCartney WH, Wilcox CB, "Computed tomography interpretations with a low-cost workstation: a timing study," *Journal of Digital Imaging*, 7(3):133-9, 1994 Aug.

Beard DV, Hemminger BM, Denelsbeck KM, Johnston RE, "How many screens does a CT workstation need?," *Journal of Digital Imaging*, 7(2):69-76, 1994 May.

Beard DV, Hemminger BM, Keefe B, Mittelstaedt C, Pisano ED, Lee JK, "Real-time radiologist review of remote ultrasound using low-cost video and voice," *Investigative Radiology*, 28(8):732-4, 1993 Aug.

Beard DV, Hemminger BM, Perry JR, Mauro MA, Muller KE, Warshauer DM, Smith MA, Zito AJ, "Interpretation of CT studies: single-screen workstation versus film alternator," *Radiology* 187(2):565-9, 1993 May.

### **Refereed Papers in Conference Proceedings**

Hemminger BM, Fox J, Ni M, "Improving the ETD submission process through automated author self contribution using DSpace", *Electronic Theses and Dissertations 2004 conference*, Lexington KY, published by NDLTD, <http://hdl.handle.net/2340/213>, 2004.

Hemminger BM, Gerald Bolas, David Carr, Paul Jones, Doug Schiff, Nick England, "Capturing Content for Virtual Museums: from Pieces to Exhibits", *Joint Conference on Digital Libraries 2004*, Tucson AZ. pp. 379.

MacMullen, W.J., Parmelee, M.C., Fenstermacher, D.A. & Hemminger, B.M. (2002). Defining an Open Metadata Framework for Proteomics: The PROMIS Project. In *Proceedings of the 2002 American Medical Informatics Association (AMIA) Annual Symposium*, p. 1093.

Hemminger BM, "Softcopy Display for Digital Mammography," Proc SPIE Medical Imaging: Visualization, Image-Guided Procedures, and Display, Vol 4681-73, 2002.

Compton KD, Hemminger BM, Oosterwijk HJ, "Practical usage of image quality verification tools", Proc. SPIE Vol. 4323, p. 148-150, Medical Imaging 2001: PACS and Integrated Medical Information Systems: Design and Evaluation; Eliot L. Siegel, H. K. Huang; Eds.

Pisano ED, Cole E, Hemminger BM, Muller K, Yaffe M, Chakraborty D, Conant E, Fajardo LL, Feig S, Jong R, Kopans D, Maidment A, Shumak R, Staiger M, Williams M. Accuracy of Digital Mammography vs. Screen-Film Mammography in a Diagnostic Mammography Population. In Digital Mammography. IWDM 2000. 5th International Workshop on Digital Mammography. (Martin J. Yaffe, Editor). Medical Physics Publishing. Madison, Wisconsin. 2001. Pages 504-511.

Oosterwijk H, Hemminger BM, Bruner AP, "Practical Usage of Image Quality Verification Tools", SPIE Vol Medical Imaging 2001: PACS and Integrated Medical Information Systems: Design and Evaluation, pg. 148.

Hemminger BM, Elodia Cole, Zong S, Yaffe MJ, Aylward SR, Maidment AD, Williams MB, Niklason LT, Johnston RE, Pisano ED, "Evaluation of digital processing methods for the display of digital mammography", Proc. SPIE Vol. 3658, p. 382-393, Medical Imaging 1999: Image Display; Seong K. Mun, Yongmin Kim; Eds.

Aylward SR, Hemminger BM, Pisano ED, "Mixture Modeling for digital mammogram display and analysis," Digital Mammography, Nijmegen 1998, Eds Karssemeijer N, Thijssen M, Hendriks J, van Erning L, Kluwer Academic Publishers, Dordrecht, 1998, p305-312.

Mawdsley GE, Yaffe MJ, Maidment ADA, Niklason L, Williams M, Hemminger BM, "Acceptance Testing and quality control of digital mammography equipment," Digital Mammography, Nijmegen 1998, Eds Karssemeijer N, Thijssen M, Hendriks J, van Erning L, Kluwer Academic Publishers, Dordrecht, 1998, p437-444.

Hemminger BM, Dillon A, Johnston RE, "Evaluation of the Effect of Display Luminance on the Feature Detection of Simulated Masses in Mammograms," Proc SPIE Medical Imaging: Image Perception, Vol 3036-12, 1997.

Hemminger BM, Muller KE, "Performance Metric for evaluating the conformance of medical image displays with the ACR/NEMA display function standard," Proc. SPIE Medical Imaging, Vol 3031-25, 1997.

Blume HR, Hemminger BM, et al., "The ACR/NEMA Proposal for a Gray-Scale Display Function Standard," Proc. SPIE Medical Imaging Vol 2707-35, Feb 1996.

Hemminger BM, Blume HR, "Are Medical Image Display Systems Perceptually Optimal: Measurements before and after Perceptual Linearization," Proc. SPIE Vol. 2707-58, p. 555-570, Medical Imaging: Image Display, Feb 1996.

Beard DV, Molina PM, Denelsbeck KM, Hemminger BM, et.al., "Stacked-Metaphor Workstation Faster than Film for Serial Staging CT," CAR, Berlin, 1995.

Hemminger BM, Molina PL, Braeuning PM, Detterbeck FC, Egan TM, Pisano ED, Beard DV, "Clinical Applications of real-time volume rendering," SPIE Medical Imaging Vol 2431, pg 65, Feb 1995.

Beard DV, Hemminger BM, Denelsbeck KM, Johnston RE, "Cognitive Load during CT Interpretation," Proc. SPIE Vol. 2166, p. 131-138, Medical Imaging: Image Perception, 1994.

David V. Beard, David H. Eberly, Bradley M. Hemminger, Stephen M. Pizer, R. E. Faith, Charles Kurak, Mark Livingston, "Interacting with image hierarchies for fast and accurate object segmentation", Proc. SPIE Vol. 2167, p. 10-17, Medical Imaging 1994: Image Processing; Murray H. Loew; Ed.

Hemminger BM, Cullip T, North MJ, "Interactive Visualization of 3D Medical Image Data," Computer Applications to Assist Radiology, S/CAR 94, Editors JM Boehme, AH Rowberg, NT Wolfman, Symposia Foundation, pp127-135, 1994.

Hemminger BM, Johnston RE, Rolland JR, Muller KE, "Perceptual Linearization of Video Display Monitors for Medical Image Presentation," Proceedings SPIE Vol 2164, Medical Imaging: Image Capture, Formatting and Display, p. 222-240, 1994.

Hemminger BM, "Isoluminance: A Color Technique for Visualizing Multivariable Medical Image Data," Proceedings SPIE Vol 1896, Medical Imaging VII: Image Capture, Formatting and Display, pp 325-335, Feb 1993.

Beard DV, Hemminger BM, Denelsbeck KM, Brown PH, "A Time Motion Comparison of Several Radiology Workstation Designs and Film," S/CAR 1992, pp588-594, Symposia Foundation, 1992.

Hemminger, BM, "Design of Useful and Inexpensive Radiology Workstations," S/CAR 1992, *Symposia Foundation*, pp. 615-624 , 1992.

Beard DV, Hemminger BM, Brown PH, Perry JR, Thompson BG, "Remote Consultation with a multiple screen FilmPlane radiology workstation," SPIE Vol 1653, Medical Imaging VI: Image Capture, Formatting and Display, pg. 310, Feb 1992.

Hemminger BM, Johnston RE, Muller KE, Mauro M, Schiebler ML, Pisano E, "A Comparison of Clinical Findings between Intensity Windowed versus CLAHE Presentations of Chest CT Images," SPIE Vol 1653, Medical Imaging VI: Image Capture, Formatting and Display, pg. 164, Feb 1992.

Beard DV, Brown P, Hemminger BM, Misra R, "Scrolling Radiologic Images: Requirements, Designs, and Analyses," Computer Assisted Radiology (CAR), pg. 636-641, Berlin July 3-6, 1991.

Beard DV, Perry JR, Muller KE, Misra R, Brown P, Hemminger BM, Johnston RE, Mauro M, Jaques P, Scheibler M, "Evaluation of Workstation Interpretation Quality with CT: A Pilot Study," Proc. SPIE Vol. 1446, Medical Imaging V: PACS Design and Evaluation, p. 52-58, Feb 1991.

Beard DV, Johnston RE, Pisano ED, Hemminger BM, Pizer SM, "A Radiology Workstation for Mammography: Preliminary Observations, Eyetracker Studies and Design," SPIE Proceedings, pg. 289, Feb 1991.

Thompson BG, Hemminger BM, "ACR-NEMA Implementation from Prototypes to the Clinic," SPIE Proceedings, Vol. 717, Medical Imaging Part II, Feb 1988.

Creasy JL, Thompson BG, Hemminger BM, Parrish DM, Johnston RE, Scatliff JH, "The ACRNEMA Test Bed at UNC," Proceedings from Computer Assisted Radiology (CAR) Conference, Berlin, July 1-4, 1987

Johnston RE, Rogers DC, Creasy JL, Beard DV, Hemminger BM, Perry JR, Pizer SM, "How to Evaluate a Medical Imaging Display Workstation," SPIE Proceedings, Vol 767 Medical Imaging, pg. 616-621, Feb 1987.

Hemminger BM, Thompson BG, Stancil PE, "Implementation of the ACRNEMA standard and Building Towards an ACRNEMA Test Facility at the University of North Carolina," SPIE Proceedings, Vol. 767 Medical Imaging, Part II, Feb 1987.

Johnston RE, Thompson BG, Creasy JL, Parrish DM, Hemminger BM, "PACS--Problems and Possibilities," Proceedings of the 28th Annual Meeting of the American Association of Physicists in Medicine Symposium, Lexington, Kentucky, August 3-7, 1986.

Rogers DC, Johnston RE, Hemminger BM, Pizer SM, "Development of and Experience with a Prototype Medical Image Display," Proceedings of the Farwest Image Perception Conference, Albuquerque, New Mexico, July 17-19, 1986.

Creasy JL, Loendorf D, Hemminger BM, "Initial Experience with a Prototype Archival System at the University of North Carolina," SPIE Proceedings, Vol. 626 Medical Imaging, Feb 1986.

Johnston RE, Rogers DC, Hemminger BM, Pizer SM, Creasy JL, Perry JR, Staab EV, Curnes JT, Parker LA, "A Multiscreen Multiple Image Display Console," SPIE Proceedings, Vol 626 Medical Imaging Part II, pp 447-450, February 1986.

**National and International Standards** (as major contributing author or editor)  
DICOM 3.1 Segmentation Storage, 2006

DICOM 3.1 Deformable Spatial Registration Storage, 2006  
DICOM 3.1 Hanging Protocols, 2004  
DICOM 3.1 Color Softcopy Presentation State Storage, 2004  
American Association of Physicists in Medicine (AAPM) Task Group 18 Assessment of Display Performance for Medical Imaging Systems 2003  
DICOM 3.0 Breast Imaging Report, 2003  
DICOM 3.0 Patient Clinical History, 2002  
DICOM 3.0 Mammography Computer Aided Detection, 2001  
DICOM 3.0 Grayscale Softcopy Presentation State Storage, 2000  
DICOM 3.0 Digital X-ray, 1999  
DICOM 3.0 Grayscale Standard Display Function, 1998

### **Unrefereed Print Publications**

Hemminger BM, Cullip T, North, MJ, “Real-time 3D Visualization for Medical Image display,” University of North Carolina at Chapel Hill, Dept of Computer Science, Technical Report TR94-027, 1994.

Hemminger BM, “Minimum Perceptual Error Calculation for Perceptual Linearization,” University of North Carolina at Chapel Hill, Dept of Computer Science, Technical Report TR94-032, 1994.

Creasy JL, Thompson BG, Hemminger BM, Parrish DM, Johnston RE, Scatliff JH, “The ACRNEMA testbed at UNC,” Magnetic Resonance Image Center Conference, Department of Radiology, University of North Carolina, Feb 1987.

### **Unrefereed Web-based Scholarly Resource Publications**

Hemminger BM, Losi T, Whisler A, Pulley M, Survey of Informatics Programs in the US, [http://ils.unc.edu/informatics\\_programs/](http://ils.unc.edu/informatics_programs/), 2006.

Hemminger BM, University of North Carolina at Chapel Hill Electronic Theses and Dissertations Program, <http://etd.ils.unc.edu/campus/>, 2006

Hemminger, BM, Handler L, Gregg L, Environmental Protection Agency Carolina Environmental Bioinformatics Research Center portal, <http://bioivlab.ils.unc.edu/CEBRC/index.html>, 2006.

Hemminger, BM, Fox J, Center for Research and Development of Digital Libraries (CRADLE) Wiki, <http://ils.unc.edu/cradle/>, 2004.

Hemminger, BM, Fox, J, University of North Carolina at Chapel Hill School of Information and Library Science Digital Library for Masters Papers, <http://etd.ils.unc.edu/dspace/>, 2004.

Hemminger, BM, Virtuals Museums (Virseum), <http://ils.unc.edu/bmh/virseum/>, 2004.

Hemminger, BM, MacMullen J, Bioinformatics, <http://www.ils.unc.edu/bioinfo/>, 2003.

Hemminger, BM, Neoref— Searching Scholarly Literature, <http://neoref.ils.unc.edu/>, 2002.

**Book Reviews**

Hemminger BM, Beard DV, book review, “3D Imaging in Medicine,” Academic Radiology, Sept 1994.

**Journal Guest Editor**

Journal of the American Society for Information Science and Technology, Guest editor, JASIST Special Topic Issue: Bioinformatics, Vol 56, No 5, 2005.