Sandeep N. Gupta

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INTERESTS: Medical Imaging and Devices, Advanced Software and Product Development, Medical Data and Image Processing, Advanced Visualization, MRI

EDUCATION: Ph.D., January 1998, Electrical and Computer Engineering
Johns Hopkins University, Baltimore, MD
Thesis: Optical Flow techniques for Motion Estimation from Tagged MR Images

M.S.E., May 1994, Electrical and Computer Engineering
Johns Hopkins University, Baltimore, MD
Emphasis on Digital Image Processing

B.Tech., June 1992, Electrical Engineering
Indian Institute of Technology, Bombay, India
Thesis: Self-organizing artificial neural networks

SKILLS:
- Medical Image Analysis (MRI, CT, Nuclear Medicine)
- Cardiac MR Imaging, Functional Oncology Imaging, Contrast Agents
- Image Registration, Image Segmentation, Advanced Visualization and Rendering
- Multi-dimensional Image Processing, Numerical Methods and Iterative Algorithms
- FDA Regulatory Processes, HIPAA Compliance, IRBs
- Extensive Customer Interaction for Research, Requirements, Design and Validation
- Six-Sigma Quality Paradigm, Design for Six-Sigma
- Product Development and Program Management, PRD Process, Leadership Training
- Programming Languages: C, C++, IDL, MATLAB, HTML
- System and network administration experience on Unix and Windows platforms

EXPERIENCE:

02/98 – present **Senior Scientist, G.E. Healthcare Technologies, Baltimore, MD.**
Worked as the lead image-processing scientist for G.E. Healthcare Technologies (formerly GE Medical Systems) Applied Science Lab in the area of cardiac MR image visualization, perfusion, viability, functional imaging, and kinetic models. Responsibilities included defining and implementing advanced image processing applications roadmap by interacting with physicians at luminary cardiac MR sites such as Johns Hopkins Hospital, Cambridge Hospital, NIH, MD Anderson, UCSF, Stanford, and Mayo Clinic. Validation experience on animal models, volunteers and clinical scans. Experience with clinical protocols and multi-center trials, documentation, IRB approvals, HIPAA compliance, and FDA regulatory processes.

09/94 - 01/98 **Research Assistant, Image Analysis and Communications Lab, Johns Hopkins Univ.**
Developed new algorithms for motion estimation from tagged cardiac MR images, and validated them through simulations. Conducted research in the areas of image segmentation, optical flow, and vector tomography.

05/94 - 08/94 **Research Assistant, Image Analysis and Communications Lab, Johns Hopkins Univ.**
Implemented a vector Wiener filter algorithm for dual-isotope radionuclide SPECT imaging. Validated methods on simulated and real brain images.

09/92 - 05/94 **Teaching Assistant, Image Analysis and Communications Lab, Johns Hopkins Univ.**
Assisted in supervising and designing laboratory class for senior-level microprocessor programming course.

07/91 - 05/92 **Research Assistant, Dept. of Electrical Eng., Indian Institute of Technology, Bombay.**
Studied applications of artificial neural networks for pattern recognition.

AWARDS: - GE Healthcare Management Award, March 2005
- Recipient of National Talent Scholarship Award from the Government of India, 1986-92.
- Ranked Third in State in Higher Secondary Examination, 1998; Ranked first in Mathematics.

PROFESSIONAL ACTIVITIES:
- GE Fundamentals for Technologists Class, March 2007.
- Member of the American Heart Association, 1998 – 2002.
- Member of the International Society for Magnetic Resonance in Medicine, 1998 – present.

REFERENCES: Available upon request.

JOURNAL PUBLICATIONS (including co-authored)**:**

1. S.N. Gupta et al., "Stochastic Models for DIV-CURL Optical Flow Methods," *IEEE Signal Processing Letters*, 3(2):32-34, Feb. 1996.
2. J.M. Links et al., "A Vector Wiener Filter for Dual-Radionuclide Imaging," *IEEE Transactions on Medical Imaging*, 15(5):700-709,May 1996.
3. S.N. Gupta and J.L. Prince, "On Variable Brightness Optical Flow for Tagged MRI," in *Information Processing in Medical Imaging*: Dordrecht: Kluwer, June 1995, pp. 323-334.
4. J.L. Prince et al., "Bandpass Optical Flow for Tagged MRI," *Medical Physics*, Vol. 27, No. 1, p 108-118, 2000.
5. G.S. Slavin et al., "First-Pass Myocardial Perfusion MRI Using Interleaved Notched Saturation: Feasibility Study," *Radiology*, vol. 239, no. 1, pp. 258--263, 2001.
6. G.M. Beache et al., "Attenuated Myocardial Vasodilator Response in Patients with Hypertensive Hypertrophy Revealed by Oxygenation-Dependent Magnetic Resonance Imaging ," *Circulation*, vol. 104, no. 11, pp. 1214--1217, September 2001.
7. S.N. Gupta, et al., "A Technique for Automated Registration of Cardiac T_2* images," *JCMR*, vol. 4, no. 1, pp. 85-86, 2002.
8. G.S. Slavin and S.N. Gupta, "Cardiac Imaging with Steady-state Free Precession: Multi-shot Echo-Planar vs Conventional Single-Echo," *JCMR*, vol. 4, no. 1, pp. 120-122, 2002.
9. S.N. Gupta et al., "Fast Method for Correcting Image Misregistration Due to Organ Motion in Time-Series MRI Data," *Mag Res Med*, 49:506—514, 2003.
10. H.A. Silber et al., "Why is Flow Mediated Dilation Dependent on Arterial Size? Assessment of the Shear Stress Using Phase Contrast MRI," *Am J Physiol Heart Circ Physiol*, 288: H822-H828, 2005.
11. L.C. Amado et al., "Accurate and Objective Infarct Sizing by Contrast-Enhanced Magnetic Resonance Imaging in a Canine Myocardial Infarction Model," *J Amer Coll Cardiol.*, 44(12): 2383-9, 2004.
12. T. Hazirolan et al., "Reproducibility of black-blood coronary vessel wall MR imaging," *J Cardio Mag Res*, 7:409-413, 2005.
13. T.K.F. Foo et al., "Enhanced Viability Imaging: Improved Contrast in Myocardial Delayed Enhancement Using Dual Inversion-Time Subtraction," In Press, *MRM*.
14. C. Ménard et al., "An Interventional MRI Technique for the Molecular Characterization of Intra-Prostatic Dynamic Contrast Enhancement," *Molecular Imaging*, 4(1):63-66, Jan-Mar 2005.
15. M.Y. Desai et al., "The apparent inversion time for optimal delayed enhancement magnetic resonance imaging differs between the right and left ventricles," *J Cardio Mag Res*, 7:475-479, 2005.
16. H.A. Silber et al., "A novel method for assessing arterial endothelial function using phase contrast magnetic resonance imaging: vasoconstriction during reduced shear." *J Cardio Mag Res*, 7(4):615-621, 2005.
17. A.T. Yan et al., "Characterization of the peri-infarct zone by contrast-enhanced cardiac magnetic resonance imaging is a powerful predictor of post-myocardial infarction mortality. *Circulation* 114(1):32-39; Jul 2006.
18. A. Schmidt et al., "Quantification of the Myocardial Infarct Border Zone by MRI Predicts Cardiac Arrhythmia Susceptibility." *Circulation* 115:2006-2014; May 2007.

(In addition, 38 Peer-reviewed abstracts and presentations in scientific conferences)

PATENTS:
Granted: US 6292683 (2001), US 6687528 (2004)
Filed: 149161 (2004), 218532 (2006)