Narayanan Krishnamurthy
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To Whom It May Concern:

I will be graduating in 2014 from University of Pittsburgh, and am a permanent resident of the USA. I am excited about software development, research and data analysis. I have coded for wireless handsets in assembly, and C for ADSP processors. Some of the projects I have completed from design inception through testing and evaluation include: 1) Auto ranging 2) Over the air FLASH programming 3) modified data link and network layers in the handset to handle dual voice and data connection in DECT based wireless in local loop system.

In graduate school I trained in neurosciences and am a fellow of the center for the neural basis of cognition. In the embedded systems course, I learnt to use Karnaugh maps to design a cyclic counter, and built a user-interfaced, temperature simulator in C using semaphores and multitasking feature of ucos Real Time OS. At my internship with Bosch Pittsburgh, I designed and implemented a higher layer protocol on top of a Control Area Network (CAN). The driver was integrated with the PRISM architectural middleware developed by Bosch and implemented addressing, fragmentation and reassembly of packets.

I like to make things work: I am good at machining at the workshop, designing prototypes using CAD software, software/hardware test and development. I am proficient with Linux, embedded systems, GPU programming, Matlab, Autocad/Solidworks, C/C++, Java, and other programming languages.

I look forward to hear from you. Thanks for your time and consideration

Sincerely,

Narayanan

BIOGRAPHICAL SKETCH

NAME Krishnamurthy, Narayanan	

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Kakatiya University, Andhra, India	BS	04/1996	Mechanical Engineering
The George Washington University, DC USA	MS	04/2003	Computer Engineering
University of Pittsburgh, Pittsburgh, USA	PhD (Candidate)	2007-Tilldate	Bioengineering

A. Personal Statement

I like to make things work: I am good at machining at the workshop, designing prototypes using CAD software, software/hardware test and development. I am proficient with Linux, embedded systems, GPU programming, Matlab, Autocad/Solidworks, C/C++, Java, and other programming languages.

B. Positions and Honors

Positions and Employment

1997-1998 Management Trainee, International Tobacco Company, Bhadrachalam Paperboards Ltd India One of the two selected through a competitive on-campus recruitment by ITC for the commissioning of their 25MW coal powered generator for the new paperboards machine in Sarrapaka

1998-2001 Senior Development Engineer, Midas Communications in collaboration with IIT Madras India Worked on multiple software development lifecycles from inception to project completion in C and Assembly language for ADSP processors. 1) Auto ranging 2) Over the air FLASH programming 3) modified data link and network layers in the handset to handle dual voice and data connection in DECT based wireless in local loop system.

2001-2003 Admissions Assistant, Admissions Office, George Washington University

2004-2006 Teaching Fellow, Electrical & Computer Engineering, University of Pittsburgh
Weekly recitations and assisted professors with undergraduate and graduate ECE classes viz. Circuits Design, Signals and Systems, Digital and Analog Communication and Filter Design, Stochastic Processes, and Discrete Signal Processing

2006-2007 Rotation/Internship: 1) CAN Software Intern for Brad Petrus BOSCH Pittsburgh,
Designed and implemented a higher layer protocol viz. the driver and daemon on top of a Control Area Network (CAN). The daemon takes care of addressing, fragmentation and reassembly. The implementation was a multithreaded application in C++, using link-list, circular queue data structures and mutual exclusion and semaphore constructs of OS and

waitForSingle event handlers. The application was integrated with the PRISM architectural middleware developed by BOSCH. 2) Student Researcher for Dr. Daniel Mosse, Computer Science Dept, University of Pittsburgh. Proposed a pub-sub architecture for emergency notification system using linux socket programming on ARM PDA's.

2007-2009 Research Assistant, Sensory Motor Integration Lab, Dr. Aaron Batista, University of Pittsburgh Designed and developed Lab VIEW based liquid reward system; Wii based IR motion capture system. Neural and behavioral data analysis and non-human primate training.

2010-tilldate Research Assistant, RF Group, Dr. Tamer S. Ibrahim, University of Pittsburgh
Designed & developed multipart helmet & multipart phantom for 7Tesla MR imaging, and benchmark validation of volume and surface coils. The goal of the proposed research is to design, develop and evaluate the 20channel transmit (Tx) and 32channel receive coil system at 7T for neuroimaging applications. Specifically we use the coils to tackle (electric and magnetic) field inhomogeneity that arises at ultra-high field MRI. I am part of the RF Group at University of Pittsburgh and we have shown the 20Ch cross-pole coil can homogenize spin
excitation in the brain with max to min < 2.7 (a TEM resonator coil at 7T has a max to min spin excitation of ~5-7). We have been able to acquire fast gradient Echo Planar images and great 2D and 3D susceptibility weighted images with whole brain coverage.

Other Experience and Professional Memberships

2007- Center for Neural Basis of Cognition, Carnegie Mellon & University of Pittsburgh
2007-09 Biomedical Engineering Society, student member
2007-09 Society of Neuroscience, student member
2010-2011 Applied Computational Electromagnetics Society, student member
2010- International Society for Magnetic Resonance in Medicine, student member

Honors

1992 Dean's List, Kakatiya University, Andhra, India
2004-2006 Teaching Fellow, Electrical and Computer Engineering University of Pittsburgh
2008 Summer Computational Trainee Center for Neural Basis of Cognition, Carnegie Mellon & University of Pittsburgh
2012 International Society for Magnetic Resonance in Medicine Educational Stipend to attend conference
2012-2013 Multimodal Neuroimaging Training Program

C. Peer-reviewed Publications

Journal

1. Effects of Receive-Only Inserts on SAR, B1+ Field and Tx Coil Performance, DOI: 10.1002/jmri.24152 JMRI August 1, 2013, Narayanan Krishnamurthy[1], Tiejun Zhao[2] and Tamer S. Ibrahim[1], 1 University of Pittsburgh, 2 Siemens Medical Solutions Pittsburgh PA USA

Conference Presentations

2. Segmentation of Small Veins Using 3D isotropic SW images at 7T , ISMRM Milan May 10,2014, Narayanan Krishnamurthy, Yujuan Zhao, Rebecca Maccloud, Tiejun Zhao, Shailesh Raval, Junghwan Kim, Caterina Rosano, Howard Aizenstein, and Tamer Ibrahim, University of Pittsburgh PA
3. Anatomically Detailed Human Head Phantom for MR, ISMRM Milan May 10,2014, Sossena Wood, Narayanan Krishnamurthy, Yujuan Zhao, Shailesh Raval, Tiejun Zhao, J. Andy Holmes, and Tamer S Ibrahim, University of Pittsburgh PA

4. On the E-field construction/deconstruction and B1+ Efficiency/Homogeneity with Transmit Array Eigen Modes , ISMRM Milan May 10,2014, Yujuan Zhao, Tiejun Zhao, Narayanan Krishnamurthy, and Tamer S. Ibrahim , University of Pittsburgh PA
5. Dual Tuned Proton/Lithium RF array Development; Feasibility Study at 7T MRI, ISMRM Milan May 10,2014 Junghwan Kim, Kyongtae Ty Bae, Narayan Krishnamurthy, Tiejun Zhao, Hoby Hetherington, and Tamer S. Ibrahim, University of Pittsburgh PA
6. Susceptibility Weighted and Echo-Planar Imaging at 7T using RF Shimming, Pittsburgh Imaging Community Retreat - Bench to Bedside MRI - University of Pittsburgh, Biomedical Science Tower, October 21st, 2013
7. 20-to-8 Channel Tx Array with 32-channel Adjustable Receive-Only Insert for 7T Head Imaging, ISMRM Utah May 6, 2013, Tamer S Ibrahim, Yujuan Zhao, Narayanan Krishnamurthy, Shailesh Raval, Tiejun Zhao, Sossena Wood and Junghwan Kim, University of Pittsburgh PA
8. Simultaneous Excitation of Distinct Electromagnetic Modes Using a Tx Array, ISMRM Utah May 6, 2013, Yujuan Zhao, Sossena Wood, Tiejun Zhao, Narayanan Krishnamurthy and Tamer Ibrahim
9. 7T Tx Body Coil with Rx-Only Insert: Preliminary Results, ISMRM Utah May 6, 2013, Shailesh B Raval, Yujuan Zhao, Tiejun Zhao, Narayanan Krishnamurthy, Sossena Wood and Tamer Ibrahim
10. Development of Cross-pole RF Tx array for Breast imaging at 7T, ISMRM Utah May 6, 2013, Junghwan Kim, Narayan Krishnamurthy, Yujuan Zhao, Tiejun Zhao, Kyongtae Ty Bae, and Tamer S. Ibrahim
11. High temporal and spatial resolution breast MR imaging at 7T; Feasibility Study using 8-to-1 channel Tx-only Array Combined with 8 channel Rx-only Insert, ISMRM Utah May 6, 2013, Junghwan Kim, Yujuan Zhao, Narayanan Krishnamurthy, Tiejun Zhao, Kyongtae Ty Bae, and Tamer S. Ibrahim
12. B1+ and Coupling Variability of Transmit Head Coils and Arrays: UHFMRI Experiments and Simulations, ISMRM Melbourne May 6, 2012; Narayanan Krishnamurthy, T. Zhao, D. Stough, S. Raval, Tamer S. Ibrahim, University of Pittsburgh PA
13. Finite Difference Time Domain (FDTD) Simulation of Receive-Only Array Inserts for 7T Transmit-Only Head Coil: Influence on B1+ Field and Specific Absorption Rate (SAR), ACES Columbus OH April 13, 2012; Narayanan Krishnamurthy Tamer S. Ibrahim, University of Pittsburgh PA
14. Effect of Receive Only Array Inserts on B1+ Field and SAR ISMRM Montreal May 6, 2011; Narayanan Krishnamurthy Tamer S. Ibrahim, University of Pittsburgh PA
15. WIIMOCAP- a low-cost motion capture system using the nintendo wiimote; Society For Neuroscience (SFN) 2009; Narayanan Krishnamurthy, D. Bacher, J. F. McFerron[3], Aaron. P. Batista[1,2]; 1-Univ. Pittsburgh, Pittsburgh, PA; 2-Center for the Neural Basis of Cognition, Pittsburgh, PA; 3-Crossroads Consulting LLC, Johnstown, PA
16. Paucity of fast-timescale correlations in monkey cortex - Bio Medical Engineering Society 2009; C. Lehocky1, Narayanan Krishnamurthy, B. M. Yu,[3], G. Santhanam[2], S. I. Ryu[2], A. Afshar[2], J. Cunningham[2], V.Gilja[2], R. Kalmar[2], Z. RiveraAlvidrez[2], K. Shenoy[2], N. Hatsopoulos[4], M. T. Harrison5, and A. P. Batista[1]; 1University of Pittsburgh, Pittsburgh, PA, 2Stanford University, Stanford, CA, 3University College London,London, UK, United Kingdom, 4University of Chicago, Chicago, IL, 5Carnegie Mellon University,Pittsburgh, PA
17. A cross-modal reach redirection task in Rhesus monkeys reveals speeded processing for vibrotactile stimuli -SFN 2009; J. M. Godlove [1,2], Narayanan Krishnamurthy[1,2], M. A. Faulkner [1],A. P. Batista[1,2]; 1Univ. Pittsburgh, Pittsburgh, PA; 2Ctr. for the Neural Basis of Cognition, Pittsburgh, PA
18. An experimental rig for closed-loop neural prosthetics - SFN 2008; D. Bacher[1], J. F. McFerron[3], Narayanan Krishnamurthy[1,2], A. P. Batista[1,2]; 1Univ. Pittsburgh, Pittsburgh, PA; 2Ctr. for the Neural Basis of Cognition, Pittsburgh, PA; 3Crossroads Consulting LLC, Johnstown, PA

D. Ongoing Research Support

R90 DA023420 S. Kim & W. Eddy (PI's) 08/01/12 - 07/31/13
Evaluate parallel transmit coils and pulse sequences for high resolution neuroimaging at 7Tesla.
Role: Fellowship Trainee

R01 R01EB00984 T.S. Ibrahim (PI) 09/01/10 - 06/31/13
Subject Insensitive and SNR Enhancing RF Arrays for High Field MRI (Partial funding)
Role: Student Researcher