Curriculum Vitae
Barbaros Özdemirel

SUMMARY

Received B.S. (1984) and M.S. (1986) degrees in electrical engineering, and Ph.D. (1992) degree in radiological sciences focusing on physics and technology of medical imaging modalities with emphasis on magnetic resonance imaging (MRI). Worked as an MRI scientist until 1996, and held electrical engineering positions in commercial organizations until 2008. Currently working as an assistant professsor in the Electrical and Electronics Engineering Department of İzmir Institute of Technology.

EDUCATION

Ph. D. September 1986 - December 1991, Physics and Engineering Division, Department of Radiological Sciences, University of California, Irvine
Dissertation: Measurement of Flow Through Porous Media by Nuclear Magnetic Resonance Imaging
Concentration: Diffusion and perfusion imaging in functional MRI, image acquisition, processing, and correction algorithms, flow measurement, RF transceivers, gradient coils, physics and technology of medical imaging modalities.

M. S. September 1984 - August 1986, High honor student, Electrical Engineering Department, Middle East Technical University, Turkey
M. S. Thesis: Observation of Ultrasonic Properties of Blood Using a Fast Data Acquisition Technique
Concentration: Ultrasonic transducers, dynamic scattering properties, digital signal processing, fast data acquisition and storage.

B. S. September 1980 - June 1984, High honor student, Electrical Engineering Department, Middle East Technical University, Turkey
Concentration: Biomedical engineering, digital control systems, computer architecture.

RESEARCH

Technological Development (Sensible Research, Inc)
- New materials and construction technologies for milli-actuators
- Ergonomics and product design requirements of reading aid devices for the blind
- Respiratory sensor test algorithms and qualification parameters

Digital Control and Storage Systems (STMicroelectronics, Inc.)
- Optimization of motor drive modulation schemes for better acoustic performance
- PRML (Partial Response-Maximum Likelihood) detection and coding schemes
- Non-linear detection and error correction methods

Magnetic Resonance Imaging (Resonex, Inc.)
- Robust pulse sequence and reconstruction algorithms for Fast Spin Echo imaging
- Characterization of non-linear gradient field response in a ferromagnetic surrounding
- Gradient response correction and optimization of imaging parameters for 3-D MR angiography

Magnetic Resonance Imaging (University of California, Irvine)
- Quantitative diffusion and perfusion imaging
- Motion artifact suppression in the presence of diffusion/perfusion sensitizing gradients
- Fluorinated-carbon blood substitutes as contrast agents in functional MRI
- Flow measurement and quantitative mapping
- Gradient field linearity optimization
- Dual-resonance RF coils and RF preamplifiers for H-1/F-19 MRI

Ultrasound (Middle East Technical University)

- Characterization of blood coagulation process through ultrasonic scattering properties
- Interleaved and dual-port memory architectures for fast, sequential storage access
- Inductive pulse generation and driver electronics for ultrasonic transducers

WORK HISTORY

February 2009 - Present: İzmir Institute of Technology, Turkey
Assistant Professor

Teaching Electronics I, Electronics II, Electronics Laboratory, Electronic Design Project, Digital System Design, and Embedded Systems courses at the undergraduate level in the Electrical and Electronics Engineering Department. Arranged course contents to facilitate students' adaptation to modern technology and development tools in the subject areas. Currently organizing laboratory facilities that will support educational activities in Digital Systems and Electronic Design areas.

November 2003 - June 2007: Sensible Research, Inc., California, U.S.A.
Vice President

Founded Sensible Research, Inc., and organized all major research activities of the company. Interviewed teachers of blind education facilities to assess ergonomic requirements and functional specifications for usability of reading aid devices for the blind. Served as the main contributor and leader of a research team, investigating novel milli-actuator technologies and analyzing their cost and feasibility for mass production. Designed and delivered quality assurance test systems for respiratory sensors. Constructed pneumatic test fixtures with analog signal conditioning circuitry and developed signal analysis software with a user interface suitable for manufacturing environment

May 1996 - May 2008: STMicroelectronics, Inc., California, U.S.A.
Senior Design and Applications Engineer

Supported research and development efforts of design groups in STMicroelectronics and client hard disk manufacturers, related to development of new architectures and design and optimization of ASICs. Designed and produced evaluation and analysis systems carrying full responsibility for all hardware and software components at all stages of the development and production process. Delivered more than 100 systems, each with several application modules for power controller, read/write channel, and preamplifier ASICs.

September 1992 - September 1995: Resonex, Inc., California, U.S.A.
Staff Scientist

Worked on projects related to Resonex MRI systems and in research studies for client companies covering a wide range of subjects such as, analog and digital circuit design, magnetics, and mechanics as well as MRI physics. Carried full responsibility at all stages of the projects including, scheduling, cost estimation, manufacturing of hardware components, development of signal acquisition/processing algorithms, and when applicable, preparation of safety documentation for FDA (Food and Drug Administration) approval.

April 1987 - August 1992: University of California, Irvine, California, U.S.A.
Graduate Student Researcher (Postgraduate Researcher after January 1992)

Majority of research studies involved design and construction of new devices for MRI that required strong electronics and mechanics background as well as knowledge of MR physics. Designed and built RF preamplifiers and RF coils for H-1/F-19 MRI at 64/60 MHz and a multi-partition gradient coil assembly using a novel spatial field linearity optimization scheme. Developed MRI pulse sequences and image reconstruction and processing programs for quantitative imaging of microvascular flow.

September 1984 - August 1986: Middle East Technical University, Turkey
Research/Teaching Assistant

Carried concurrent duties as a member of the biomedical engineering and digital electronics groups in the Electrical Engineering Department. Designed and built an ultrasonic signal

acquisition system including various ultrasonic transducers, a transducer driver pulse generator, a digitizer unit with interleaved dual-port memory, and signal acquisition/processing programs. Assisted courses on systems programming, assembly language programming, and digital circuit design.

PUBLICATIONS

A. Bayrak, B. Çalargün, Ç. Pala, B. Özdemirel, ve E. Tatlıcıoğlu, "DGM Sinyali Kullanarak Adım Motorunun Güç Kontrolü," Otomatik Kontrol Türk Milli Komitesi Otomatik Kontrol Ulusal Toplantısı (TOK'10), 565-568, Gebze, Kocaeli, Eylül 2010.

B. Özdemirel, and O. Nalcıoğlu "Correction of Chemical Shift Artifacts in Multislice F-19 Imaging With Perfluorooctyl Bromide (PFOB)" Magnetic Resonance in Medicine, **23**, pp. 324-332, 1992.

B. Özdemirel, and O. Nalcıoğlu "Restricted Molecular Diffusion in Emulsified Perfluorooctyl Bromide (PFOB)" 11th Annual Meeting of SMRM, 1206, 1992.

B. Özdemirel, A. G. Wile, A. Berkmen, and O. Nalcıoğlu "Measurement of Microvascular Flow in Rabbit Kidney with Perfluorooctyl Bromide (PFOB)" 10th Annual Meeting of SMRI, 170, p. 86, 1992.

B. Özdemirel, and O. Nalcıoğlu "Suppression of Motion Artifacts due to Diffusion or Microvascular Flow Sensitizing Gradients" 10th Annual Meeting of SMRI, 185, p. 91, 1992.

B. Özdemirel, A. G. Wile, A. Berkmen, and O. Nalcıoğlu "Quantification of Microvascular Blood Flow by F-19 Imaging" 10th Annual Meeting of SMRM, 776, 1991.

B. Özdemirel, and O. Nalcıoğlu "A Composite Imaging Pulse Sequence for Measurement of Microvascular Flow With Perfluorooctyl Bromide (PFOB)" 10th Annual Meeting of SMRM, 795, 1991.

B. Özdemirel, and O. Nalcıoğlu "Chemical Shift Artifact Correction in Multislice F-19 Imaging With Perfluorooctyl Bromide (PFOB)" 9th Annual Meeting of SMRI, JMRI **1** (2), 247, p.189, 1991.

B. Özdemirel, and O. Nalcıoğlu "Inductive Tuning of Shielded Bird-cage RF coils" 8th Annual Meeting of SMRM, 942, 1989.

B. Özdemirel, and O. Nalcıoğlu "Transmission Line Resonator RF Receiver Coil For Breast MR Imaging" 7th Annual Meeting of SMRM, 265, 1988.

B. Özdemirel, and O. Nalcıoğlu "Linearity Optimization in Saddle-coil Gradient Systems" 6th Annual Meeting of SMRI, 419, p. 114, 1988.

B. Özdemirel, and H. Köymen "Single Card 25 MHz Digitizer" 8th Annual Conference of IEEE Engineering in Medicine and Biology Society, pp. 835-837, 1986.

SCHOLARSHIPS AND AWARDS

UNESCO Fellowship Award, 1986.

TÜBİTAK (Turkish Institute for Scientific and Technological Research) scholar, 1980-84.

ÜSYM (University Student Selection and Placement) Exam, 14th highest grade, 1980.