

Ernesto Akio Yoshimoto

CONTACT INFORMATION

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Immigration Status: Permanent Resident

PROFESSIONAL SUMMARY

M.Sc. in Biomedical and Electrical Engineering, specialized in image and video reconstruction, segmentation and lesion detection for MRI scanners, using technologies such as deep learning, digital image processing and signal models to improve the detection of tissue abnormalities. ECG and EEG embedded systems designer.

EDUCATION

2016-2018 **New York University, School of Engineering**, New York City, NY, U.S.

M.Sc. in Biomedical Engineering

Thesis: : Rapid MRI Of The Knee Using Accelerated Turbo Spin-Echo Sequence With A Combination Of Multicoil Compressed Sensing, Simultaneous Multislice And Elongated Echo Trains.

Advisor: Prof. Ricardo Otazo

2005-2008 **University of New Mexico, Department of Electrical Engineer**, Albuquerque, NM, U.S.

M.Sc. in Electrical Engineering

High Spatial Resolution Proton-Echo-Planar-Spectroscopic-Imaging (PEPSI) MRI spectroscopy reconstruction to get anatomical and physiological information of the brain.

Advisor: Prof. Stefan Posse.

1994-2001 **Pontificia Universidad Catolica del Peru - Department of Electrical Engineer**, Lima, Peru

B.Sc. in Electrical Engineering

Thesis: Implementation of a morphological processing algorithm for digital images in an Altera CPLD

Advisor: Eng. Gerard Santillán

WORK EXPERIENCE

January 2010 - June 2019: **Research Assistant, New York University**, NYC, NY, U.S.

Developed and performed accelerated acquisition in MRI scanner and perform reconstruction on human knees to segment and detect pathologies using Deep Learning, Parallel Imaging and Compressed Sensing using MATLAB, Python and C/C++ in the NYU image reconstruction group.

Implemented and developed a quantification and qualification tool from MRI video data to determined human tissue based on MRI signal models and speed up the acquisition with parallel imaging and processing with parallel computing using MATLAB, Python and C/C++. The EMC Based T2-Mapping Package, is used in cancer clinical studies.

Implemented a real time digital electrocardiogram embedded system with a PC user interface in Python and C/C++.

August 2006 - December 2009: **Research Scientist, University of New Mexico**, Albuquerque, NM, U.S.

Developed a high-resolution MRI whole brain spectroscopy reconstruction to get anatomical and physiological information.

Develop fMRI image reconstruction to enhance spatial-temporal resolution.

Implemented reconstruction and tissue quantification of Single-Shot MR Spectroscopic imaging.

January 2004 - August 2005: **Head of the Digital Image Processing Research Group, Pontificia Universidad Catolica del Peru, Lima, Peru.**

Manage and supervise student projects performed in digital image processing using programmable devices.

Projects: Probe cell counter, traffic sensing, speech recognition, circuit designs using C/C++, Verilog, VHDL and AHDL.

January 1999 - August 2005: **Electrical Engineering Instructor, Pontificia Universidad Catolica del Peru, Lima, Peru.**

Instructor in Electrical engineering and Computer Science.

TEACHING EXPERIENCE

Instructor

- ☐ PUCP, Circuit Analysis : 2004 to 2005
- ☐ PUCP, Digital Circuits: 2004 to 2005
- ☐ PUCP, Digital Circuits Laboratory: 2000 to 2005
- ☐ PUCP, Digital Signal and Image Processing: 2005

Teaching Assistant

- ☐ PUCP, Electronic Design: 1999 to 2001
- ☐ UNM, Digital Circuits Laboratory: 2006

SKILLS

- ☐ Leadership, Consulting
- ☐ MRI imaging reconstruction
- ☐ Digital video, image and signal processing
- ☐ Image quality evaluation
- ☐ Embedded systems
- ☐ ECG and EEG
- ☐ Machine Learning and Deep Learning (Tensorflow, Pytorch)
- ☐ AI for Auto-encoders and NLP
- ☐ C/C++, Python, MATLAB, VHDL, Verilog, OpenCV
- ☐ Video codecs and compression standards (H.264, MPEG)
- ☐ Knowledge of CUDA, OpenCL
- ☐ Knowledge of R, Java, SQL
- ☐ Knowledge of Amazon AWS, Google cloud
- ☐ Knowledge of Jupyter and Colaboratory
- ☐ Knowledge of Github

LANGUAGES

- ☐ Native speaker of Spanish.
- ☐ Fluency in English.

PAPERS, PROCEEDINGS AND PRESENTATIONS

Rapid MRI Of The Knee Using Accelerated Turbo Spin-Echo Sequence With A Combination Of Multicoil Compressed Sensing, Simultaneous Multislice And Elongated Echo Trains (M.Sc. Thesis 2018)

SyntheticTSE: Accelerated multicontrast spin-echo knee MRI using a combination of Bloch-simulation models, compressed sensing and simultaneous multislice acquisition (ISMRM 2018)

Enhancing Spatial-Temporal Resolution in Simultaneous Multi-Slab Echo Volumar Imaging (ISMRM 2018)

Rapid knee MRI using TSE sequences accelerated with a combination of simultaneous multislice, multicoil compressed sensing and elongated echo trains (ISMRM 2017)

A new method for accurate detection of cartilage lesions in femoroacetabular impingement using quantitative T2 mapping: preliminary validation against arthroscopic findings at 3T (MRM 2016)

Identification of quantitative differences in normal-appearing white matter of multiple sclerotic

patients vs. healthy controls using a novel Bloch-simulation-based T2 mapping technique (MRM 2015)

Whole Brain Segmented Echo-Volumar-Imaging increases fMRI Sensitivity compared to Multi-Slice Echo-Planar-Imaging (MRM 2011)

3D High Spatial Resolution Short TE Proton-Echo-Planar-Spectroscopic-Imaging (PEPSI) at 3T in Clinically Feasible Measurement Times (MRM 2010)

Cerebrospinal Fluid Partial Volume Correction in Quantitative Short TE Magnetic Resonance Spectroscopic Imaging (MRM 2010)

Comparison of TE-averaged with short TE Proton-Echo-Planar-Spectroscopic-Imaging (PEPSI) for Mapping Glutamate in Human Brain (MRM 2009)

Diffusion-Sensitive Single-Shot Proton-Echo-Planar-Spectroscopic-Imaging (PEPSI) in Human Brain (MRM 2009)

High Spatial Resolution Proton-Echo-Planar-Spectroscopic-Imaging (PEPSI) in Human Brain at 3 Tesla using 32-Channel RF Coil Array (MRM 2009)

Single-Shot MR Spectroscopic Imaging with Partial Parallel Imaging (MRM 2009)

Implementation of a morphological processing algorithm for digital images in an Altera CPLD (B.Sc. Thesis 2001)

REFERENCES

PhD. Ricardo Otazo , Memorial Sloan Kettering Cancer Center, (646)-608-8282, otazotoj@mskcc.org (M.Sc. NYU advisor)

Dr. Stefan Posse, University of New Mexico School of Medicine, (505)-272-3756, sposse@unm.edu (M.Sc. UNM advisor)