

Jeffrey Wigdahl

Research Scientist, Student Member IEEE

jwigdahl@visionquest-bio.com

Mobile: (210) 393-9118; Fax: (505) 508-5308

Research Scientist with interest in retinal image analysis and medical image processing. I have 3 years of experience working in retinal image analysis projects at a leading medical image analysis company. Projects include automatic algorithms for retinal landmark, image quality, and disease detection using the Matlab programming language.

Education

M.S., Electrical Engineering, The University of New Mexico (UNM), January 2011 – Present

Focus: Digital Image Processing (Expected Graduation – July 2013)

GPA: 3.72

B.S., Electrical Engineering, St. Mary's University, San Antonio, Texas May 2010

Professional Experience

9/2010 - Research Scientist, VisionQuest Biomedical, LLC, Albuquerque, New Mexico.

VisionQuest Biomedical is one of the leading companies in the retinal image processing field. As a part of VisionQuest, I have worked in the development of their Diabetic Retinopathy Risk Analyzer system. For that project, I have performed experiments to optimize our classification performance which lead to a conference paper. I have also contributed to algorithms for optic disc and macula detection which include vessel segmentation methods.

Additionally, I have been involved in the development of algorithms for the detection of images with inadequate quality for grading. I developed an algorithm for the automatic detection and segmentation of crescent/halo artifacts. I also performed experiments to see the effects of image quality on many of our other algorithms.

Other duties at VisionQuest include:

- Proposal writing and reviewing
- IT and code repository administrator
- Software verification and validation
- Image Grading, marking

1/2012 – 5/2013 Research Assistant, Dept. of Electrical and Computer Engineering (ECE), UNM

Perform large dataset analysis using different machine learning and graph analysis techniques to determine curriculum difficulty and student graduation rates across universities. This project is part of a UNM initiative to improve retention and graduation rates university wide.

5/2010 – 9/2010 Research Intern, VisionQuest Biomedical, LLC, Albuquerque, New Mexico

Optimized Matlab routines for retinal image processing. At the end of this internship I transitioned to a full-time position as a research scientist at VisionQuest.

Primary Areas of Active Research

- Medical Image and Video Processing and Analysis
- Machine Learning
- Graph Theory
- Retinal Image Quality
- Automatic detection of diabetic retinopathy

Skills and Classes of Interest

- Highly Proficient in Matlab programming.
- Experienced in C/C++, Ruby, Assembly programming
- Certified retinal image grader
- Various statistical packages (STATA, SAS)
- Digital Image Processing, fMRI analysis, Biostatistics, Advanced Image Processing

List of Publications

Journals

- C. Agurto, H. Yu, V. Murray, **J. Wigdahl**, MS Pattichis, S. Nemeth, S. Barriga, and P. Soliz, "A Multiscale Decomposition Approach to Detect Abnormal Vasculature in the Optic Disc," *submitted to IEEE Journal of Biomedical and Health Informatics*.
- C. Agurto, V. Murray, H. Yu, **J. Wigdahl**, MS Pattichis, S. Nemeth, S. Barriga, and P. Soliz, "A Multiscale Optimization Approach to Detect Exudates in the Macula," *submitted to IEEE Journal of Biomedical and Health Informatics*.

Conferences

- **J. Wigdahl**, C. Agurto, V. Murray, S. Barriga, and P. Soliz, "Training Set Optimization and Classifier Performance in a Top-down Diabetic Retinopathy Screening System," *Proc. SPIE 8670*, 2013.

Abstracts

- C. Agurto, H. Yu, **J. Wigdahl**, V. Murray, ES Barriga, W. Bauman, and P Soliz, "Detection of neovascularization in digital fundus images using multiscale analysis approach", *submitted to ARVO*, 2013.
- ES Barriga, C. Agurto, H. Yu, V. Joshi, C. Carranza, **J. Wigdahl**, S. Nemeth, G. Zamora, W. Bauman, and P. Soliz, "Fully automatic risk assessment of diabetic retinopathy in digital fundus images" *submitted to ARVO*, 2013.
- ES Barriga, V. Murray, C. Agurto, G. Zamora, H. Yu, **J. Wigdahl**, S. Nemeth, W. Bauman, and P. Soliz, "Statistical Validation of An Automated Algorithm for Diabetic Retinopathy Screening", *ARVO*, 2012.

Society Membership

- IEEE, student member since 2012
- SPIE, student member since 2012
- EMBC, student member since 2012
- ARVO, member since 2011