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Medical Imaging 2014:

Digital Pathology

Metin N. Gurcan
Anant Madabhushi
Editors

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Introduction

Last year, we introduced a new conference, Digital Pathology, at the SPIE Medical Imaging Symposium in Orlando, Florida. Although it was the newest conference in Medical Imaging, it received enormous attention. The quality of the presented talks, posters and the resulting papers exceeded our expectations. This year in San Diego, like everybody else, we were curious to see if we could repeat the success of the previous year.

The second Digital Pathology conference took place 16–17 February, in the Town and Country Inn in San Diego, California. The meeting began with the plenary session entitled "*Path, Present and Future,*" delivered by Dr. Richard Levenson from University of California, Davis Medical Center. Dr. Levenson's keynote talk on advances in digital and molecular pathology drew in over 250 attendees from all the various conferences, including Digital Pathology; Image Processing; Computer-Aided Diagnosis; and Image Perception, Observer Performance, and Technology Assessment; and resulted in some very lively discussion following the talk. The rest of the conference was similarly very heavily subscribed.

Another highlight of the meeting this year was the workshop we organized called "*What do pathologists see on a slide: Implications for Digital Pathology*." Three board-certified pathologists from the United States: Dr. John Tomaszewski, University at Buffalo, Dr. Ulysses Balis, University of Michigan, Dr. Richard Levenson, Univ. of California, Davis Medical Center, and an academic pathologist from the United Kingdom, Dr. Darren Treanor, University of Leeds, presented a Pathology 101 for the SPIE Medical imaging audience. The participating pathologists projected the digitized images of slides pertaining to renal disease, breast, and prostate cancer and conversed with the audience on features that they were seeing on the slide. Dr. Tomaszewski presented a comprehensive list of challenges in the digital pathology image analysis to the SPIE medical imaging community, while Dr. Balis showcased how algorithms like SiVQ can be used for high throughput annotation of digitized slides. Drs. Treanor and Levenson took questions from the audience on some of the major challenges and opportunities for routine use and adoption of digital pathology and computerized image analysis in histopathology.

The presented papers covered such diverse topics as imaging and pathology conversion, Processing and Storage of Microscopic Images, Performance and Human Factors. We would like to acknowledge the excellent work in the following papers:

Conference finalist of the Robert F. Wagner Best Student Paper Award for Digital Pathology (9041)
Towards automatic patient selection for chemotherapy in colorectal cancer trials
Paper 9041-9

Student Author: Alexander I. Wright, Univ. of Leeds (United Kingdom)
Authors: Derek R. Magee, Philip Quirke, Univ. of Leeds (United Kingdom); Darren E. Treanor, Univ. of Leeds (United Kingdom), Leeds Teaching Hospitals NHS Trust (United Kingdom)

Poster Awards

Cum Laude Poster Award

A multiview boosting approach to tissue segmentation
Paper 9041-26
Authors: Jin Tae Kwak, Sheng Xu, Peter A. Pinto, Baris Turkbey, Marcelino Bernardo, Peter L. Choyke, Bradford J. Wood, National Institutes of Health (United States)

Honorable Mention Poster Award

Novel 3D cryo-histology method for validation of 3D imaging modalities
Paper 9041-29
Authors: David Prabhu, Mohammed Q. Quatish, Case Western Reserve Univ. (United States); Emile Mehanna, Univ. Hospitals of Cleveland (United States); Zhuxian Zhou, Madhusudhana Gargesha, Andrew M. Rollins, Case Western Reserve Univ. (United States); Marco Costa, Hiram G. Bezerra, Univ. Hospitals of Cleveland (United States); David L. Wilson, Case Western Reserve Univ. (United States)

The continued success of the new DP conference was in no small part to the outstanding efforts of the program committee, who carefully constructed the program, and SPIE Conference Chairs Drs. Ehsan Samei and David Manning, and SPIE staff, who kindly guided us through all the steps of the program organization.

Next year, the Digital Pathology conference at SPIE Medical Imaging will take place in Orlando, Florida. We look forward to seeing you there for another successful conference.

Metin N. Gurcan
Anant Madabhushi

Awards

Robert F. Wagner Award

Robert F. Wagner was an active scientist in the SPIE Medical Imaging meeting, starting with the first meeting in 1972 and continuing throughout his career. He ensured that the BRH, and subsequently the CDRH, was a sponsor for the early and subsequent Medical Imaging meetings, helping to launch and ensure the historical success of the meeting. The Robert F. Wagner All-Conference Best Student Paper Award (established 2014) is acknowledgment of his many important contributions to the Medical Imaging meeting and his many important advances to the field of medical imaging.

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2014 Recipients:

First Place: **MRI signal and texture features for the prediction of MCI to Alzheimer's disease progression** (9035-78)
A. Martínez-Torteya, J. A. Rodriguez-Rojas, J. M. Celaya-Padilla, J. I. Galván-Tejada, V. M. Treviño-Alvarado, Sr., J. G. Tamez-Peña, Tecnológico de Monterrey (Mexico)

Second Place: **Distinguishing benign confounding treatment changes from residual prostate cancer on MRI following laser ablation** (9036-49)
G. Litjens, H. Huisman, Radbound Univ. Nijmegen Medical Ctr. (Netherlands); R. Elliot, Case Western Reserve Univ. (United States); N. Shih, M. Feldman, Univ. of Pennsylvania (United States); S. Viswnath, Case Western Reserve Univ. (United States); J. Futterrer, J. Bomers, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); A. Madabhushi, Case Western Reserve Univ. (United States)

Conference Award

2014 Recipients:

Cum Laude Poster Award: **A multiview boosting approach to tissue segmentation** [9041-26]
J. T. Kwak, S. Xu, National Institutes of Health Clinical Ctr. (United States); P. A. Pinto, B. Turkbey, M. Bernardo, P. L. Choyke, National Cancer Institute (United States); B. J. Wood, National Institutes of Health Clinical Ctr. (United States)