

Peter D. Burns, Ph.D.
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PROFESSIONAL SUMMARY

Imaging scientist with extensive experience in development, analysis and evaluation of digital imaging systems. Consultant for imaging in cultural institutions. Technical project leader in Research and Innovation labs for a team developing 3D digital image processing for medical and dental applications. Technical expert on international product development teams for imaging performance and image quality improvement. Knowledge of image processing appropriate for; consumer, forensic, remote-sensing and medical applications. Familiar with performance standards for x-ray detectors. Patent holder.

- Camera evaluation and image processing
- Capture color pipeline consulting for mobile imaging
- Software tools for imaging performance benchmarking
- Imaging technology consultant for US and European national libraries and museums
- Matlab for prototyping and deployment - 15 years' experience
- Detector imaging performance: modeling, estimation and simulation
- International imaging performance standards
- Image quality assurance for scanners and cameras in image conversion projects

PROFESSIONAL EXPERIENCE

Burns Digital Imaging, Fairport, New York

2011-present

Digital imaging consulting. Applications include imaging for cultural heritage, digital photography and reconnaissance systems. More information at company [website](#)

Goodrich ISR, Westford, Massachusetts

2011 – 2013

Consultant: Digital imaging system performance evaluation, image processing and design analysis for reconnaissance applications.

Imaging Science Associates, Williamson, New York

2004 - present

Imaging technology consultant for US and European national libraries and museums.

Carestream Health, Inc., Rochester New York

2007 - 2011

Project Leader / Principal Scientist

Led a technical team developing image processing for 3D dental image acquisition and display. Member of Research and Innovation Labs. responsible for medical image processing development and prototyping. This included 3D dental x-ray, (color) intra-oral imaging, and digital mammography applications. Member of several international product design teams addressing, e.g., color video image processing path, image noise reduction, and medical image restoration.

- Led project developing digital image processing algorithms for improved 3D images for dental business in Paris.

- Developed and prototyped image processing path for dental caries detection based on combining visible and fluorescent image records. Currently in commercialization.
- Delivered software for x-ray detector performance evaluation needed for government regulations. Results from this software are currently archived for federal (FDA) audits.

Eastman Kodak Company, Rochester New York

1983 - 2007

Principal Image Scientist (1997-2007)

Member of an applied research group addressing image quality, image processing, and design for electronic imaging systems. Internal technical consultant for design and improvement of digital cameras and printers, medical systems. In this role, completed technical analysis, simulation and design projects for, e.g., laser printing of medical images, document image processing, and film scanning. Refer to Technical addendum (page 3) for examples. My previous position at Kodak was Research Scientist.

- Provided method and software for measuring optical distortion and falloff in digital camera. Adopted in first Kodak product with in-camera panoramic image stitching.
- Led US Air Force funded project on digital camera identification.
- Wrote Matlab software for evaluating performance of digital cameras and scanners. It is the reference implementation used by international standards bodies (e.g. ISO).

Rochester Institute of Technology, Rochester New York

1994 – 1996

Resident graduate student

Conducted Ph.D. research at the Center for Imaging Science (degree completed in 1997). The dissertation topic was 'Image Noise Analysis in Multispectral Color Acquisition.' This included multispectral (more than three records) image capture, image noise modeling, scene spectral reflectance reconstruction, and various color transformations.

OTHER RELEVANT EXPERIENCE

Xerox Corp., Rochester New York

Engineer - Technical Specialist

Analysis and measurement of electro-photographic (copier and printer) systems.

- Developed and published a mathematical noise model for halftone reproduction and a practical method for measurement.

EDUCATION, PROFESSIONAL DEVELOPMENT AND ASSOCIATIONS

Ph.D. Imaging Science, Rochester Institute of Technology, Rochester, NY, 1997.

B.Sc. and M. Eng. Electrical and Computer Eng., Clarkson Univ., Potsdam NY, 1974, 1977.

Lecturer for university and industrial training courses

Adjunct professor in Center for Imaging Science, RIT

Fellow of Society for Imaging Science and Technology (IS&T), 2011

Board Treasurer of IS&T, 2004-2008

Executive Editor for *IS&T Reporter* 2007-present

Davies Medal from Royal Photographic Society, for contributions to digital imaging, 2004

Life Senior member of Institute for Electrical and Electronic Engineering (IEEE), 2017

US Patents (23)

- 10,070,791, Apparatus for caries detection, 2015
- 9,060,690, Apparatus for caries detection, 2015
- 8768025, Dental Shade Mapping, 2014
- 8,866,894, Method for real-time visualization of caries condition, 2014
- 8630473, Noise suppression in cone beam CT projection data, 2104
- 8605974, Apparatus for caries detection, 2013
- 8571281, Dental shade mapping, 2013
- 8494248, Noise suppression in cone beam CT projection data, 2013
- 8346007, Noise suppression in cone beam CT projection data, 2013
- 8306302, Noise suppression in diagnostic images, 2012
- 8270689, Apparatus for caries detection, 2012
- 8224045, System for early detection of dental caries, 2012
- 8077949 Apparatus for caries detection, 2011
- 8055052, Artifact suppression in diagnostic images, 2011
- 7826097 Asymmetrical Digital Filters for Dot Gain Adjustments, 2010
- 7702139 Apparatus for Caries Detection, 2010
- 7683950 Method and apparatus for correcting channel dependent color aberration in digital image, 2010
- 7365881 Halftone dot-growth technique based on morphological filtering, 2008
- 7116447 Halftone dot-growth technique using a dot edge-detection scheme, 2006
- 6870564 Image processing for improvement of color registration in digital images, 2005
- 6707950 Method for modification of non-image data in an image processing chain, 2004
- 6584233 Method for determining the components of image noise patterns of an imaging device and use of this method in an imaging device, 2003
- 5617223 Image scanner and method for improved microfilm image quality, 1997

Recent Technical Articles (from 75+ publications. Full list available upon request)

- D. Williams and Peter D. Burns, [Refining the Theory-to-Practice Path for FADGI Still Imaging](#), *Proc. IS&T Archiving Conf.*, 2020
- P. D. Burns, D. Williams, J. Griffith, H. Hall and S. Cahall, [Application of ISO Standard Methods to Optical Design for Image Capture](#), *Proc. IS&T Electronic Imaging Symposium, Image Quality and System Performance, IQSP-240*, 2020
- P. D. Burns and D. Williams, [Camera Resolution and Distortion: Advanced Edge Fitting](#), *Proc. IS&T Electronic Imaging Symposium 2018, Image Quality and System Performance XV*
- R. Branca, S. Triantaphilidou, and P. D. Burns, [Texture MTF from images of natural scenes](#), *IS&T International Symposium on Electronic Imaging, Image Quality and System Performance XIV*, pg. 113-120, 2017
- D. Williams and P. D. Burns, [Rethinking Image Color Correction, Validation and Testing](#), *Proc. IS&T Archiving Conf.*, 2016
- P. D. Burns and D. Williams, [Going Mobile: Evaluating Smartphone Capture for Collections](#), *Proc. IS&T Archiving Conf.*, 2016
- D. Williams and P. D. Burns, [Color Correction Meets Blind Validation for Image Capture: Are We Teaching to the Test?](#), *IS&T International Symposium on Electronic Imaging, IQSP-218.1*, 2016
- P. D. Burns and D. Williams, [Evaluation of 3D-Projection Image Capture](#), *Proc. IS&T Archiving Conference*, IS&T, pg. 70-73, 2015
- P. D. Burns, [‘Image Quality Concepts’](#) chapter in the *Handbook of Digital Imaging*, edited by M. Kriss. John Wiley & Sons, Ltd: Chichester, UK, pp. 325-372, 2015
- D. Williams and P. D. Burns, [Evolution of Slanted Edge Gradient SFR Measurement](#), *Proc. SPIE Vol. 9016, Image Quality and System Performance XI*, 2014)

D. Williams and P. D. Burns, [Image Stitching: Exploring Practices, Software and Performance](#), *Proc. IS&T Archiving Conference*, IS&T, pg. 126-131, 2013

P. D. Burns, J. B. Phillips and D. Williams, [Adapting ISO 20462 Softcopy Quality Ruler Method for on-line Image Quality Studies](#), *Proc. SPIE Vol. 8653*, , 86530E-1, 2013