



Sonal Kothari Phan, Ph.D., P.E.

Managing Engineer

3350 Peachtree Road NE, Suite 1125 | Atlanta, GA 30326

(678) 412-4824 tel | skothari@exponent.com

Professional Profile

Dr. Phan is a licensed professional electrical engineer with expertise in signal processing, machine learning, computer networks, and computer security. She has assisted industrial and legal clients in matters related to product development, product quality and similarity assessments, intellectual property analyses, due diligence, and product reliability analyses. She has extensive experience in software algorithm development and software engineering best practices.

Dr. Phan has leveraged her knowledge in electrical engineering and computer science to assist clients with applications involving transmission and distribution lines, smart meters, solar farms, network security products, mobile cameras, wearable cameras, automotive transmission systems, unmanned automated vehicles (UAVs/Drones), smart transportation systems, Android/iOS/Windows versions of a software product, and a variety of consumer electronics. She has performed on-site inspections, reviewed technical literature, designed experiments using industry standards, developed custom testing apparatuses, and analyzed data to effectively advise clients.

Dr. Phan has developed software solutions for various applications including largescale keyword search from thousands of documents, automated object recognition in drone and satellite images, animal and human face segmentation, and image classification. She has also developed computational geometry software for measuring various properties and characterizing failure modes of materials and polymers using photographs, scanning electron microscope images, and optical microscope images. Dr. Phan is proficient with MATLAB, has experience with several programming languages and development environments, including Python, Java, C++, Javascript, and LTSpice, and with several open source software libraries, including OpenCV, Lucene, Solr, and D3.

Before joining Exponent, Dr. Phan's doctoral and postdoctoral research focused on big data analytics. She has experience with developing prediction models using large scale datasets, handling acquisition related artifacts in data, and developing interactive visualizations for data interpretation and knowledge discovery. Her work led to novel algorithms for image segmentation, color normalization, and image description. She was a guest lecturer at Georgia Institute of Technology on topics such as signal processing, image processing, data analytics, and visualization.

Academic Credentials & Professional Honors

Ph.D., Electrical and Computer Engineering, Georgia Institute of Technology (Georgia Tech), 2013

M.S., Electrical and Computer Engineering, Georgia Institute of Technology (Georgia Tech), 2011

B.E., Electronics and Communication Engineering, Jai Narain Vyas University, 2008

Licenses and Certifications

Licensed Electrical Engineer, California, #21821

Computer Hacking Forensic Investigator (CHFI)

CompTIA Network+ Certified

CompTIA Security+ Certified

Professional Affiliations

IEEE Member

PES Member

SEMDA Member

Publications

Phan SK, Chen C. Big Data and Monitoring the Grid. In The Power Grid 2017; 253-285.

Kothari S, Wu H, Tong L, Woods K, Wang MD. Automated Risk Prediction for Esophageal Optical Endomicroscopic Images. IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI). Las Vegas, Nevada, USA. 2016 Feb 24-27; 160-163.

Phan JH, Hoffman RA, Kothari S, Wu P, Wang MD. Integration of Multi-Modal Biomedical Data to Predict Cancer Grade and Patient Survival. IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI). Las Vegas, Nevada, USA. 2016 Feb 24-27; 577-580.

Phan JH, Kothari S, and Wang MD. omniClassifier: a desktop grid computing system for Big Data prediction modeling. ACM Conference on Bioinformatics, Computational Biology and Biomedicine, ACM-BCB. Newport Beach, CA, USA. 2014 Sep 20; 514-23.

Hoffman RA, Kothari S, and Wang MD. Comparison of normalization algorithms for cross-batch color segmentation of histopathological images. Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC. Chicago, IL, USA. 2014 Aug 26; 194-7.

Zachariah N, Kothari S, Ramamurthy S, Osunkoya AO, and Wang MD. Evaluation of performance metrics for histopathological image classifier optimization. Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC. Chicago, IL, USA. 2014 Aug 26; 1933-6.

Champion A, Lu G, Walker M, Kothari S, Osunkoya AO, and Wang MD. Semantic interpretation of robust imaging features for Fuhrman grading of renal carcinoma. Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC. Chicago, IL, USA. 2014 Aug 26; 6446-9.

Kothari S, Phan JH, Stokes TH, Osunkoya AO, Young AN, and Wang MD. Removing batch effects from histopathological images for enhanced cancer diagnosis. IEEE Journal of Biomedical and Health Informatics. 2014 May; 18(3):765-72.

Stokes TH, Kothari S, Cheng CW, Wang MD. Quality control and analysis algorithms for tissue microarrays as biomarker validation tools. In Rueda L. ed. Microarray image and data analysis: Theory and practice. CRC Press/Taylor & Francis, Dec. 2013.

Hoffman RA, Kothari S, Phan JH, and Wang MD. A high-resolution tile-based approach for classifying

biological regions in whole-slide histopathological images. IFMBE International Conference on Health Informatics, IFMBE-ICHI. Vilamoura, Portugal. 2013 Nov 7; 42: 280-3.

Kothari S, Phan JH, and Wang MD. Eliminating tissue-fold artifacts in histopathological whole-slide images for improved image-based prediction of cancer-grade. J Pathol Inform. 2013 Aug 31; 4:23.

Kothari S, Phan JH, Stokes TH, and Wang MD. Pathology imaging informatics for quantitative analysis of whole-slide images. Journal of the American Medical Informatics Association. 2013 Aug 19; 20:1099-108.

Poruthoor A, Phan JH, Kothari S, and Wang MD. Exploration of genomic, proteomic, and histopathological image data integration methods for clinical prediction. IEEE China SIP. Beijing, China. 2013 Jul 6; 259-63.

Kothari S, Phan JH, Young AN, and Wang MD. Histological image classification using biologically interpretable shape-based features. BMC Medical Imaging. 2013 Mar 13; 13:9.

Kothari S, Phan JH, Osunkoya AO, and Wang MD. Biological interpretation of morphological patterns in histopathological whole-slide images. ACM Conference on Bioinformatics, Computational Biology and Biomedicine, ACM-BCB. Orlando, FL, USA. 2012 Oct 7; 218-25.

Kothari S, Phan JH, and Wang MD. Scale normalization of histopathological images for batch invariant cancer diagnostic models. Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC. San Diego, CA, USA. 2012 Aug 28; 4406-9.

Kothari S, Phan JH, Young AN, and Wang MD. Histological image feature mining reveals emergent diagnostic properties for renal cancer. IEEE International Conference on Bioinformatics and Biomedicine, BIBM. Atlanta, GA, USA. 2011 Nov 12; 422-5.

Kothari S, Phan JH, Moffitt RA, Stokes TH, Hassberger SE, Chaudry Q, Young AN, and Wang MD. Automatic batch-invariant color segmentation of histological cancer images. IEEE International Symposium on Biomedical Imaging, ISBI. Chicago, IL, USA. 2011 Mar 30; 657-60.

Kothari S, Chaudry Q, and Wang MD. Extraction of informative cell features by segmentation of densely clustered tissue images. Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC. Minneapolis, MN, USA. 2009 Sep 2; 6706-9.

Kothari S, Chaudry Q, and Wang MD. Automated cell counting and cluster segmentation using concavity detection and ellipse fitting techniques. IEEE International Symposium on Biomedical Imaging, ISBI. Boston, MA, USA. 2009 Jun 28; 795-8.

Other Publications

Phan SK, Stepan J, Cotts BRT. Electrical Conductor Spacing Standards for Printed Circuit Boards. Exponent Electrical Engineering and Computer Science Newsletter. Vol. 4, 2016.

Phan SK, Shai DE. Software Quality Standards: An Approach to Reduce Lifecycle Costs. Exponent Electrical Engineering and Computer Science Newsletter. Vol. 4, 2016.

Meeting Abstracts

Bhatia AK, Phan JH, Kothari S, Shehata B, Wang M. Automated Analysis of Histopathological Whole Slide Images to Diagnose Pediatric Heart Transplant Rejection. The Journal of Heart and Lung Transplantation. 2015 Jan 4;34(4):S327.

Kothari S, Phan JH, Wang MD. Histological image classification using biologically interpretable shape-

based features. Annual Meeting of the Biomedical Engineering Society, BMES, 2013.

Kothari S, Phan JH, Wang MD. TissueViz: An information-visualization tool for studying histopathological whole-slide images. Annual Meeting of the Biomedical Engineering Society, BMES, 2013.

Poruthoor A, Kothari S, Rosenthal S, Phan JH, Wang MD. Integrative analysis of genomic, proteomic, and histopathological ovarian cancer data. Annual Meeting of the Biomedical Engineering Society, BMES, 2012.

Meyer A, Stokes TH, Kothari S, Wang MD. Pathological imaging quality control: Biopsy segment imaging versus whole tissue slide imaging. Annual Meeting of the Biomedical Engineering Society, BMES, 2012.

Kothari S, Phan JH, Wang MD. Image resolution normalization for batch-invariant histological cancer diagnostic models. Poster, Georgia Tech Research and Innovation Conference, 2012.

Kothari S, Phan JH, Wang MD. Biological interpretation of image biomarkers for cancer diagnosis. Annual Meeting of the Biomedical Engineering Society, BMES, 2011.

Kothari S, Chaudry Q, Phan JH, Young AN, Wang MD. Automatic color segmentation of histological images for cancer diagnosis. Annual Meeting of the Biomedical Engineering Society, BMES, 2011.

Chaudry Q, Raza SH, Jaybhaye C, Kothari S, Wang MD. Analysis and quantification of QD-IHC images. AMIA Annual Symposium, 2009.

Kothari S, Chaudry Q, Wang MD. Automatic segmentation of densely clustered binary nuclei mask images. Annual Meeting of the Biomedical Engineering Society, BMES, 2009.

Peer Reviewer

IEEE Transactions on Biomedical Engineering

IEEE Transactions on Medical Imaging

Computer Methods and Programs in Biomedicine