

Pinaki Sarder, PhD
Associate Professor (with tenure)

December 24, 2021

Department of Pathology and Anatomical Sciences (Primary)
Department of Biomedical Engineering (Adjunct)
Jacobs School of Medicine and Biomedical Sciences
University at Buffalo — The State University of New York
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Education:

Terminal Degrees

2010: Ph.D., Electrical Engineering, Washington University in St. Louis (WUSTL)

Advisor: Prof. Arye Nehorai

Dissertation: *Statistical Design and Imaging of Position-Encoded 3D Microarrays*

2010: M.Sc., Electrical Engineering, WUSTL

Advisor: Prof. Arye Nehorai

2003: B.Tech., Electrical Engineering, Indian Institute of Technology, Kanpur, India

Traineeships

Apr 2011 - Mar 2015: Postdoctoral Research Associate, Optical Radiology Laboratory, Division of Radiological Sciences, Mallinckrodt Institute of Radiology, Washington University School of Medicine (WUSM)

Mentor: Prof. Samuel Achilefu

Training: Fluorescence Molecular Imaging, including Multi-Photon & Fluorescence Lifetime (FLT) Imaging Microscopy of cells & tissues and FLT Molecular Tomography of small animals.

Apr 2010 - Mar 2011: Research Fellow, Department of Biostatistics, Harvard School of Public Health

Training: Large Scale Data Mining

Jan 2007 - Dec 2007: Imaging Sciences Fellow, Imaging Sciences Pathway Program, Division of Biology and Biomedical Sciences, WUSM

Professional Appointments:

Jul 2021 - Present: Associate Professor (with tenure), University at Buffalo (UB) — The State University of New York

Department of Pathology and Anatomical Sciences (Primary), Department of Biomedical Engineering (Adjunct), Jacobs School of Medicine and Biomedical Sciences (Jacobs School)

Group: <http://www.acsu.buffalo.edu/~pinakisa/research.html>

Research: Computational Pathology, Microscopy Image Analysis, Multi-Modal Data Fusion

Teaching: Course Director of *Introduction to Biomedical Image Analysis (BE 461 & 561)*

Apr 2015 - Jun 2021: Assistant Professor (tenure-track), UB

Department of Pathology and Anatomical Sciences (Primary), Department of Biomedical Engineering (Adjunct), Jacobs School

Jun 2015 - Jun 2020: Assistant Professor (courtesy appointment), UB

Department of Biostatistics (Adjunct), School of Public Health and Health Professions

Awards & Honors:

Keynote Speaker, *the Histopathological Image Analysis (HIMA) Workshop, Pathology Informatics Meeting*, Pittsburgh, PA, May 2022.

Senior Author of the abstract “Automatic segmentation of arteries, arterioles, and glomeruli in renal biopsies with thrombotic microangiopathies,” which was selected for the best abstract award in *Annual Meeting of the German Society of Nephrology*, Rostock, Germany, Sep. 23-26, 2021.

Senior & Corresponding Author of the article “PodoSighter: A cloud-based tool for label-free podocyte detection in kidney whole slide images,” which was selected for the cover of the November issue of the *Journal of the American Society of Nephrology (JASN; IF: 10.12)* in 2021.

Community Champion, The International Society for Optics and Photonics (SPIE), 2021.

Senior & Corresponding Author of the abstracts: (i) “Prognostic glomerular morphometric phenotype discovery via clustering across large datasets” and (ii) “Urinary proteomics data guides AI to discover new digital biomarkers for diabetic nephropathy classification,” which were selected by the Renal Pathology Society as two out of the three best abstracts for 2020-21.

Senior & Corresponding Author of the abstract “Probabilistic modeling of diabetic nephropathy progression,” which was selected as one of the two runner-ups for the best poster award in *SPIE Medical Imaging – Digital Pathology*, Houston, TX, February 19-20, 2020.

Senior & Corresponding Author of the article “Computational segmentation and classification of diabetic glomerulosclerosis,” which was selected for the *Best of ASN Journals: Clinical JASN & JASN* in 2019.

Invited Participant, Expert Roundtable on the “Potential Power and Challenges in the Use of Artificial Intelligence (“Big Data”) for Improved Risk Stratification and Management of Kidney Disease,” The Rogosin Institute and pulseData, New York, NY, October 18, 2019.

Recipient, Travel Award, The Kidney Precision Medicine Project (KPMP) Consortium, National Institutes of Health (NIH) - National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), to attend *the KPMP Face-to-Face Meeting*, Washington, DC, September 24-25, 2019.

Recipient, UB Exceptional Scholars - Young Investigator Award 2018.

Recipient, Travel Scholarship, Clinical and Translational Science Award Workforce Development Core, UB, to attend *the 2017 Translational Science Meeting*, Washington, DC, April 19-21, 2017.

Who’s Who Recognition: Included in the “AcademicKeys Who’s Who in Sciences Higher Education and Who’s Who in Medicine Academia.”

Senior Member, The Institute of Electrical and Electronics Engineers (IEEE), December 2015 to Present. [IEEE is the world’s largest association of technical professionals with >433K members in >160 countries around the world. Only 9% of IEEE’s members hold this grade, which requires extensive experience, and reflects professional maturity and documented achievements of significance.]

First author of one of the 10 best “Editors’ Pick” articles in 2012-13 in *Biomicrofluidics* journal from American Institute of Physics.

Recipient, Travel Grant, Foundation for the NIH, *2010 Human Microbiome Research Conference*, St. Louis, MO, August 31 to September 2, 2010.

Marshal, School of Engineering and Applied Science, WUSTL, Commencement, May 21, 2010.

Recipient, Imaging Sciences Pathway program Graduate Student Fellowship, WUSM, January-December 2007.

Professional Society Memberships:

2021-Present: Member, The International Society for Computational Biology.

2021-Present: Adjunct Member, The United States and Canadian Academy of Pathology.

2019-Present: Member, The Renal Pathology Society.

2018-Present: Member, The American Society of Nephrology.

2015-Present: Senior Member, IEEE.

2015-16 & 2020-Present: Member, The International Society for Optics and Photonics (SPIE).

2019: Member, The North American Neuroendocrine Tumor Society.

2019: Member, The American Association for Cancer Research.

2015-16: Member, The Biophysical Society.

2004-15: Member, IEEE.

Scientific Talks:

Note:

A gray text-box with ‘UB’ indicates work conducted at UB.

♠ indicates that the talk was originally scheduled as an in-person talk; however, it was presented via web due to COVID-19 pandemic in 2020-21.

International

1. “Integrated biomedical signal processing in research and education,” Invited seminar at the *School of Medical Science and Technology, Indian Institute of Technology (IIT), Kharagpur, India*, Aug. 6, 2014.
2. “Integrated biomedical signal processing in research and education,” Invited seminar at the *Department of Electrical Engineering, IIT, Delhi, India*, Aug. 4, 2014.
3. “Integrated biomedical signal processing in research and education,” Invited seminar at the *Department of Electrical Engineering, IIT, Madras, India*, Aug. 1, 2014.
4. “Integrated biomedical signal processing in research and education,” Invited seminar at the *Department of Electrical Engineering, Indian Institute of Science, Bangalore, India*, Jul. 30, 2014.
5. “Integrated biomedical signal processing in research and education,” Invited seminar at the *Department of Biomedical Engineering, IIT, Hyderabad, India*, Jul. 29, 2014.
6. “Integrated biomedical signal processing in research and education,” Invited seminar at the *Department of Biosciences and Bioengineering, IIT, Bombay, India*, Jul. 22, 2014.
7. “Integrated biomedical signal processing in research and education,” Invited seminar at the *Department of Electrical Engineering, IIT, Kanpur, India*, Jul. 21, 2014.

National

1. Invited talk scheduled for *the Joint Statistical Meeting (Session: Innovations in Digital Pathology and Spatial Transcriptomics: Statistical Challenges and Major Impact,)* Washington, DC, Aug. 6-11, 2022. UB
2. Invited seminar scheduled at the *Department of Electrical Engineering, University of Pittsburgh, Pittsburgh, PA*, May 2022. UB
3. Keynote talk scheduled for *the Histopathological Image Analysis (HIMA) Workshop, Pathology Informatics Meeting, Pittsburgh, PA*, May 2022. UB
4. “Harnessing the power of artificial intelligence in renal pathology,” Invited talk at *the United States and Canadian Academy of Pathology’s (USCAP’s) 109th Annual Meeting 2020, Los Angeles, CA*, Mar. 1, 2020. UB
5. “Computational image analysis in nephropathology,” Invited seminar at the *NIH - NIDDK, Washington, DC*, Jan. 15, 2020. UB
6. “Introduction to digital pathology using examples from renal pathology,” Invited seminar at the *Department of Physics, Washington University in St. Louis, St. Louis, MO*, Mar. 19, 2018. UB

7. “Toward using biological priors for quantitative biomedical image analysis,” Invited seminar at the *Department of Electrical and Computer Engineering, Rowan University, Philadelphia, PA*, Apr. 26, 2016. UB
8. “Automated quantification of glomeruli features in renal pathology,” Conference platform talk at *SPIE Medical Imaging–Digital Pathology, San Diego, CA*, Mar. 3, 2016. UB
9. “Quantitative bio-imaging in research and education,” Invited seminar at the *Department of Pathology and Anatomical Sciences, UB, Buffalo, NY*, Oct. 21, 2014.
10. “Toward integrated optical imaging of deep tissues,” Invited seminar at the *Department of Computer & Electrical Engineering and Computer Science, Florida Atlantic University, Boca Raton, FL*, Mar. 28, 2014.
11. “Deep tissue imaging using fluorescence microscopy and tomography,” Invited seminar at the *Department of Bioengineering, Temple University, Philadelphia, PA*, Mar. 11, 2014.
12. “Deep tissue imaging using all–near-infrared multi-photon microscopy,” Invited seminar at the *Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ*, Feb. 25, 2014.
13. “Statistical design of position-encoded microsphere arrays,” Invited seminar at the *Department of Biomedical Engineering, Johns Hopkins University, Baltimore, MD*, Feb. 1, 2011.
14. “Statistical design of position-encoded 3D microarrays,” Invited seminar at the *University of Texas Southwestern Medical Center, Dallas, TX*, Feb. 11, 2010.
15. “Statistical design of position-encoded 3D microarrays,” Invited seminar at the *Department of Biostatistics, Harvard School of Public Health, Boston, MA*, Jan. 15, 2010.

Regional

1. “Computational image analysis in pathology,” Invited seminar in *the GI TRG Meeting* at the *Department of Surgical Oncology, Roswell Park Comprehensive Cancer Center, Buffalo, NY*, Dec. 18, 2019. UB

Local

1. “AI for Biomedical & Clinical applications: A key for the next generation “Renaissance Scientists,” Grand round talk at the *Department of Pathology and Anatomical Sciences, UB, Buffalo, NY*, Jan. 10, 2019. UB
2. “Functional understanding of microbial communities using experimental data integration,” Seminar in the *Program in Quantitative Genomics Working Group, Department of Biostatistics, Harvard School of Public Health, Boston, MA*, Oct. 5, 2010.
3. “Statistical design of position-encoded 3D microarrays,” Seminar at the *Department of Electrical and Systems Engineering, Washington University in St. Louis (WUSTL), St. Louis, MO*, Feb. 8, 2010.
4. “Statistical design and imaging of an ultra-high density 3D microarray,” Seminar at the *Department of Electrical and Systems Engineering, WUSTL, St. Louis, MO*, Jan. 16, 2009.
5. “Gene ranking using the Page-Rank algorithm,” Seminar in the *Systems Analysis Group, WUSTL, St. Louis, MO*, Sep. 5, 2007.

6. “Locating quantum-dot encoded microparticles from ultra-high-density 3D microarrays,” Seminar in the *Imaging Sciences Symposium, Division of Biology and Biomedical Sciences, Washington University School of Medicine, St. Louis, MO*, Jul. 18, 2007.

Webinars

1. “Computational nephropathology: From basics to applications: Applications of computational pathology to nephropathology research - Part 2,” Seminar in Nephropathology as part of a joint venture between the *Glomerular Disease Study & Trial Consortium (GlomCon) and the Renal Pathology Society (RPS)*, Jan. 27, 2020. Talk URL: https://youtu.be/Jj9Hrcldi_w UB
2. “Computational nephropathology: From basics to applications: Applications of computational pathology to nephropathology research - Part 1,” Seminar in Nephropathology as part of a joint venture between the *GlomCon and RPS*, Nov. 26, 2019. Talk URL: <https://youtu.be/BW1qoEwvg0A> UB

Web Talks

1. “Problems and opportunities in computational renal pathology,” Invited seminar[♠] at the *Department of Pathology, Immunology, and Laboratory Medicine, College of Medicine, University of Florida, Gainesville, FL*, Dec. 1, 2021. UB
2. “Problems and opportunities in computational renal pathology,” Invited seminar[♠] at the *Department of Biomedical Engineering, University of Texas Southwestern Medical Center, Dallas, TX*, Nov. 19, 2021. UB
3. “Problems and opportunities in computational renal pathology,” Invited seminar[♠] at the *AI & Human Health Seminar Series, Icahn School of Medicine at Mount Sinai and Hasso Plattner Institute of Digital Health, New York, NY*, Nov. 11, 2021. UB
4. “Computational nephropathology for kidney transplantation and chronic kidney diseases,” Invited talk[♠] at the *XXXV Portuguese Nephrology Congress & XIII Luso-Brazilian Nephrology Congress, Vilamoura Congress Center, Portugal*, Oct. 15, 2021. UB
5. “Integrating image analysis with deep learning and omics to study podocyte-specific changes in renal diseases,” Talk[♠] at the *Kidney Precision Medicine Project (KPMP) Consortium’s Semi-Annual Meeting, Washington, DC*, Oct. 14, 2021. UB
6. “Problems and opportunities in computational renal pathology,” Invited seminar[♠] at the *Division of Renal Disease and Hypertension, School of Medicine, University of Colorado Anschutz Medical Campus, Aurora, CO*, Sep. 29, 2021. UB
7. “Human AI loop in cloud for distributed computation,” Invited talk at the *29th Conference on Intelligent Systems for Molecular Biology and 20th European Conference on Computational Biology, Online*, Jul. 28, 2021. UB
8. “Problems and opportunities in computational renal pathology,” Invited talk at the *Departments of Biomedical Engineering and Computer & Data Sciences, Case Western Reserve University, Cleveland, OH*, Jul. 28, 2021. UB
9. “Machine learning in digital pathology,” Invited seminar at the *8th Semi-Annual NIH O’Brien Center Microscopy Workshop, Indiana University, Indianapolis, IN*, Jun. 9, 2021. UB
10. “A toolbox for computational pathology using examples from renal pathology,” Invited seminar in the *GI TRG Meeting at the Department of Surgical Oncology, Roswell Park Comprehensive Cancer Center, Buffalo, NY*, Jun. 16, 2021. UB

11. “Computational tools for renal pathology informatics,” Invited talk in *Banff Digital Pathology Working Group Zoom Meeting, Online*, May 27, 2021. **UB**
12. “Computational nephropathology for chronic kidney diseases,” Invited talk at the *Brigham and Women's Hospital Computational Pathology Symposium, Harvard Medical School, Boston, MA*, Apr. 20, 2021. **UB**
13. “Urinary proteomics data guides AI to discover new digital image biomarkers for diabetic nephropathy classification,” Talk[♣] at the *Kidney Precision Medicine Project (KPMP) Consortium's Semi-Annual Meeting, Washington, DC*, Apr. 7, 2021. **UB**
14. “Feature segmentation in KPMP whole slide images,” Talk[♣] at the *KPMP Consortium's Semi-Annual Meeting, Washington, DC*, Apr. 7, 2021. [Jointly presented with Mr. Yijiang Chen (Case Western Reserve University) and Ulysses Balis, MD (University of Michigan at Ann Arbor)] **UB**
15. “Assessing IFTA in KPMP whole slide images,” Talk[♣] at the *KPMP Consortium's Semi-Annual Meeting, Washington, DC*, Apr. 7, 2021. [Jointly presented with Mr. Yijiang Chen (Case Western Reserve University)] **UB**
16. “Beyond segmentation in computational nephropathology,” Invited seminar at the *Department of Pathology and Laboratory Medicine, University of California at Davis, Sacramento, CA*, Mar. 17, 2021. **UB**
17. “Artificial intelligence in diabetic nephropathy,” Invited talk at the *AI in Nephropathology Workshop Amsterdam 2021, Online*, Mar. 12, 2021. **UB**
18. “Large scale mining of urinary proteomics data guides AI to discover new digital image biomarkers for diabetic nephropathy classification,” Invited talk[♣] at the *Clinical-Pathological Conferences 2020, Brazil*, Nov. 19, 2020. **UB**
19. “Computational renal pathology: Growing opportunities for engineers,” Invited seminar[♣] at the *Department of Biomedical Engineering, University of Houston, Houston, TX*, Aug. 28, 2020. **UB**
20. “Machine vision for predicting disease trajectory from renal microanatomy,” Invited talk at the *Deep Learning for Digital Pathology (DLDP) Forum, Center for Biomedical Informatics, University of Missouri, Columbia, MO*, Jul. 24, 2020. **UB**
21. “A computational renal pathology suite for KPMP,” Talk[♣] at the *KPMP Consortium's Semi-Annual Meeting, Washington, DC*, Mar. 17, 2020. **UB**
22. “Quantitative bio-imaging in research and education,” Seminar at the *Department of Electronics and Electrical Communication Engineering, IIT, Kharagpur, India*, Nov. 28, 2014.
23. “Quantitative bio-imaging in research and education,” Seminar at the *Department of Electrical Engineering, IIT, Roorkee, India*, Nov. 25, 2014.
24. “Quantitative bio-imaging in research and education,” Seminar at the *Department of Electrical Communication Engineering, Indian Institute of Science, Bangalore, India*, Oct. 13, 2014.
25. “Integrated biomedical signal processing in research and education,” Seminar at the *Department of Electronics and Communication Engineering, IIT, Roorkee, India*, Jul. 8, 2014.
26. “Integrated biomedical signal processing in research and education,” Seminar at the *Department of Electrical Engineering, IIT, Hyderabad, India*, Jun. 13, 2014.
27. “Statistical design and imaging of an ultra-high density 3D microarray,” Seminar at the *Department of Electrical Engineering, IIT, Bombay, India*, Nov. 20, 2009.

Declined Invited Talks

1. Keynote talk for *32nd Conference on Graphics, Patterns and Images SIBGRAPI 2019, Rio De Janeiro, Brazil*, Oct. 28-31, 2019. **UB**

Talks by Mentees:

National

1. N. Lucarelli, “Computational integration of renal histology and urinary proteomics using deep learning regression,” Conference platform talk at *SPIE Medical Imaging–Digital & Computational Pathology, San Diego, CA*, Feb. 21, 2022. **UB**
2. S. P. Border, “HistoLens: A stand-alone tool for quantitative feature visualization of glomerular histology images,” Conference platform talk at *SPIE Medical Imaging–Digital & Computational Pathology, San Diego, CA*, Feb. 21, 2022. **UB**
3. D. Govind, “Integrating image analysis with single cell RNA-seq data to study podocyte-specific changes in diabetic kidney disease,” Conference platform talk at *SPIE Medical Imaging–Digital & Computational Pathology, San Diego, CA*, Feb. 21, 2022. **UB**
4. B. Lutnick, “Computational quantification of IFTA for CKD cases of Kidney Precision Medicine Project,” Conference platform talk at *ASN Kidney Week 2021, Online (due to COVID-19 pandemic)*, Nov. 5, 2021. **UB**
5. B. Lutnick, “User friendly, cloud based, whole slide image segmentation,” Conference platform talk at *SPIE Medical Imaging–Digital & Computational Pathology, Online (due to COVID-19 pandemic)*, Feb. 14, 2021. **UB**
6. D. Govind, “Automated detection and quantification of Wilms’ Tumor 1-positive cells in murine diabetic kidney disease,” Conference platform talk at *SPIE Medical Imaging–Digital & Computational Pathology, Online (due to COVID-19 pandemic)*, Feb. 14, 2021. **UB**
7. B. Santo, “Automated podocyte quantification for evaluation of chronic kidney disease,” Conference platform talk at *the USCAP 109th Annual Meeting 2020, Los Angeles, CA*, Mar. 2, 2020. **UB**
8. D. Govind, “Deep learning-based automated hot-spot detection and tumor grading in human gastrointestinal neuroendocrine tumor,” Conference platform talk at *SPIE Medical Imaging–Digital Pathology, Houston, TX*, Feb. 20, 2020. **UB**
9. L. K. Murali, “Generative modeling for renal microanatomy,” Conference platform talk at *SPIE Medical Imaging–Digital Pathology, Houston, TX*, Feb. 20, 2020. **UB**
10. B. Lutnick, “Generative modeling for label-free glomerular modeling and classification,” Conference platform talk at *SPIE Medical Imaging–Digital Pathology, Houston, TX*, Feb. 19, 2020. **UB**
11. D. Govind, “SKIE: An automated approach to quantitation of Ki-67 index from human gastrointestinal neuroendocrine tumor,” Conference platform talk at *the North American Neuroendocrine Tumor Society 2019 Annual Symposium and Meeting, Boston, MA*, Oct. 5, 2019. **UB**
12. A. Majumder, “Examining structural patterns and causality in diabetic nephropathy using inter-glomerular distance and Bayesian graphical models,” Conference platform talk at *SPIE Medical Imaging–Digital Pathology, San Diego, CA*, Feb. 21, 2019. **UB**
13. O. Simon, “Examining structural changes in diabetic nephropathy using inter-nuclear distances in glomeruli,” Conference platform talk at *SPIE Medical Imaging–Digital Pathology, Houston, TX*, Feb. 11, 2018. **UB**

14. B. Lutnick, “Deep variational auto-encoders for unsupervised glomerular classification,” Conference platform talk at *SPIE Medical Imaging–Digital Pathology, Houston, TX*, Feb. 11, 2018. **UB**
15. B. Ginley, “Computational analysis of the structural progression of human diabetic nephropathy glomeruli,” Conference platform talk at *SPIE Medical Imaging–Digital Pathology, Houston, TX*, Feb. 11, 2018. **UB**
16. B. Lutnick, “Cross-species knowledge transfer between murine and human histopathology using artificial intelligence,” Conference platform talk at *Visualization and Data Analysis 2018, Burlingame, CA*, Jan. 31, 2018. **UB**
17. B. Lutnick, “Leveraging unsupervised training sets for multi-scale compartmentalization in renal pathology,” Conference platform talk at *SPIE Medical Imaging–Digital Pathology, Orlando, FL*, Feb. 13, 2017. **UB**
18. B. Ginley, “Automatic computational labeling of glomerular textural boundaries,” Conference platform talk at *SPIE Medical Imaging–Digital Pathology, Orlando, FL*, Feb. 13, 2017. **UB**
19. B. Ginley, “Identification and characterization of neutrophil extracellular trap shapes in flow cytometry,” Conference platform talk at *SPIE Medical Imaging–Digital Pathology, Orlando, FL*, Feb. 13, 2017. **UB**

Services to Profession:

Scientific Committees

2021-Present: Associate Member, Human BioMolecular Atlas Program Consortium, NIH - OD.

2021-Present: Member, Presentation & Publication Committee, Kidney Precision Medicine Project (KPMP) Consortium, NIH - NIDDK.

2020-Present: Member, Pathology & Molecular Integration Committee, KPMP Consortium, NIH - NIDDK.

2017-Present: Member, Steering Committee, Diabetic Complications (DiaComp) Consortium, NIH - NIDDK.

2017-Present: Member, Nephropathy Committee, DiaComp Consortium, NIH - NIDDK.

Proposal Reviews, Panels, & Expert Roundtable

Reviewer, Innovative Science Accelerator (ISAC) Program, NIH - NIDDK, 2021-Present.

Reviewer, The Netherlands Organisation for Scientific Research (NWO/ZonMw) Veni-Programme, 2021.

Reviewer, German Research Foundation, 2021.

Reviewer, New Frontiers in Research Fund - Exploration 2020-21, Government of Canada.

Reviewer, Florida Department of Health Biomedical Research Program Grants, 2020.

National Science Foundation (NSF) Reviewer 2020-22. [For NSF reviews and Panels, here and elsewhere some information are omitted per NSF guideline.]

Invited Participant, Expert Roundtable on the “Potential Power and Challenges in the Use of Artificial Intelligence (“Big Data”) for Improved Risk Stratification and Management of Kidney Disease,” The Rogosin Institute and pulseData, New York, NY, Oct. 18, 2019.

External Evaluator, Grants submitted to the Universidad de Puerto Rico-Río Piedras Campus’s Institutional Research Fund, University of Puerto Rico, San Juan, PR, 2019.

Reviewer, Grants submitted to the Pilot and Feasibility Program, DiaComp, NIH - NIDDK, 2018-19.

Member, Bio Advisory Panel, NSF.

Panel Member, Smart and Connected Health, NSF.

Editorial Duties

2019-Present: Member, Editorial Board, Statistics & Bioinformatics, *Journal of the American Society of Nephrology*.

2018-21: Academic Editor, *Plos One*

Journal Reviewer (select ones)

Nature Machine Intelligence

Nature Communications

Journal of the American Society of Nephrology

Kidney International

Nature Reviews Nephrology

Communications Biology - Nature

Clinical Journal of the American Society of Nephrology

Kidney360

Journal of Clinical Investigation

Scientific Reports - Nature

IEEE Trans. on Medical Imaging

Medical Image Analysis - Elsevier

IEEE Journal of Biomedical and Health Informatics

IEEE Trans. on Image Processing

IEEE Journal of Selected Topics in Signal Processing

IEEE Signal Processing Magazine

IEEE Signal Processing Letters

IEEE Trans. on NanoBioscience

Plos Computational Biology

Cell Reports Medicine

Plos One

Journal of Medical Imaging - SPIE

Image and Vision Computing - Elsevier

Biomedical Signal Processing and Control - Elsevier

Journal of Biophotonics - Wiley

Journal of Biomedical Optics - SPIE

Optics Express - Optical Society of America

American Chemical Society (ACS) Nano

Journal of Microscopy - The Royal Microscopical Society

IEEE Sensors Journal

Society Service

2020: Member, Program Committee, Renal Pathology Society. [Responsibility includes providing proposals for the 2021 USCAP (the United States and Canadian Academy of Pathology) Companion Meeting.]

Conference Organization, Committees, & Reviewer

Session Chair, Session: *Multispectral, Multimodality, and Fused Imaging, SPIE Medical Imaging–Digital & Computational Pathology*, San Diego, CA, Feb. 20, 2022.

Session Chair, Session: *Technical Aspects, AI in Nephropathology Workshop Amsterdam 2021*, Amsterdam, Netherlands, 2021.

Member, Organizing Committee, *AI in Nephropathology Workshop Amsterdam 2021*, Amsterdam, Netherlands, 2021.

Member, Program Committee, *SPIE Medical Imaging–Digital & Computational Pathology*, 2020–Present.

Session Chair, Session: *Integration of Multimodal and Spatial Information, SPIE Medical Imaging–Digital Pathology*, Houston, TX, Feb. 20, 2020.

Moderator, Session: *Computational Image Analysis: Shaping the Future of Nephropathology, The American Society of Nephrology’s The Kidney Week 2019*, Washington, DC, Nov. 7, 2019.

Program Chair, *32nd Conference on Graphics, Patterns and Images SIBGRAPI 2019*, Rio De Janeiro, Brazil, Oct. 28–31, 2019.

Member, Program Committee, *Visualization and Data Analysis*, Burlingame, CA, 2017–20.

Member, Technical Program Committee, *International Conference on Neuroscience and Cognitive Brain Information*, 2016–19.

Reviewer, *IEEE International Conference on Signal and Image Processing Applications 2015*, Kuala Lumpur, Malaysia, Oct. 19–21, 2015.

Member & Reviewer, Program Committee, *2015 IEEE International Workshop on Machine Learning for Signal Processing*, Boston, MA, Sep. 17–20, 2015.

University at Buffalo Service:

Judge, Undergraduate Research Poster Presentation, 13th Annual Summer Research Poster Symposium, The Collegiate Science & Technology Entry Program, 2019.

Senator, Faculty Senate, 2018–20.

Reviewer, Clinical and Translational Science Institute (CTSI) Pilot Studies at Pennsylvania State University, 2019.

Member & Reviewer, Life Sciences Panel, Innovative Micro-Programs Accelerating Collaboration in Themes (IMPACT), 2018.

Jacobs School Service:

Judge, Annual Medical Student Research Forum, 2020–22.

Member, Select Committee on Facilities Planning, 2016–22.

Member, Admission Committee, PhD Program in Biomedical Sciences (PPBS), 2016–17, 2019–20.

Advocate for Department of Pathology and Anatomical Sciences, Diversity and Inclusion, Apr. 2015–Present.

Department (Pathology and Anatomical Sciences) Service:

Member, Appointments and Promotion Committee, 2021-Present.

Member, Graduate Faculty Committee, 2015-Present.

Member, Department Council, 2015-Present.

Member, Review Committee, Graduate Program on Computational Cell Biology, Anatomy, and Pathology, 2015-17.

Member, Faculty Search Committee, 2015-17, 2021-Present.

Courses Taught & Other Educational Activities:

University at Buffalo

2019-Present: Instructor, Biomedical Sciences.

Course Title: BMS 516: Fundamentals of Biomedical Research II

Credits: 3

Total Enrollment:

Fall 2021: Graduate: 19

Fall 2020: Graduate: 15

Fall 2019: Graduate: 12

Number of Lectures: 2 per semester (3 h contact, including 2.66 h teaching per semester)

Course Evaluation Score:

Fall 2019: 4.2/5.0 (Course), 4.0/5.0 (Instructor)

2019-Present: Instructor, Biomedical Sciences.

Course Title: BMS 515: Fundamentals of Biomedical Research I

Credits: 4

Total Enrollment:

Fall 2021: Graduate: 19

Fall 2020: Graduate: 15

Fall 2019: Graduate: 12

Number of Lectures:

Fall 2020 - Present: 2 (9 h contact, including 2.66 h teaching per semester)

Fall 2019: 1 (2 h contact, including 1.33 h teaching per semester)

Course Evaluation Score:

Fall 2019: 4.0/5.0 (Course), 4.0/5.0 (Instructor)

2019: Instructor, Pathology and Anatomical Sciences.

Course Title: PAS 514: Seminar

Credits: 1

Total Enrollment:

Fall 2019: Graduate: 6

Number of Lectures: 1 per semester (1.5 h contact, including 1 h teaching per semester)

2018-Present: Instructor, Pathology and Anatomical Sciences.

Course Title: PAS 520: Microscopic Imaging

Credits: 3

Total Enrollment:

Fall 2021: Graduate: 11

Spring 2020: Graduate: 7

Fall 2018: Graduate: 12

Number of Lectures:

Spring 2020 - Present: 4 (12 h contact, including 10 h teaching)

Fall 2018: 6 (17.5 h contact, including 15 h teaching)

Course Evaluation Score:

Fall 2018: 4.1/5.0 (Course), 3.7/5.0 (Instructor)

2018-Present: Instructor, Pathology and Anatomical Sciences.

Course Title: PAS 505: Microscopic Anatomy & Computational Methods

Credits: 4

Total Enrollment:

Fall 2021: Graduate: 2

Fall 2020: Graduate: 3

Fall 2019: Graduate: 3

Fall 2018: Graduate: 6

Number of Lectures: 1 per semester (2.5 h contact, including 2 h teaching per semester)

Course Evaluation Score:

Fall 2018: 4.5/5.0 (Course), 4.5/5.0 (Instructor)

2016-Present: Course Director & Instructor, Biomedical Engineering.

Course Title: BE 461/561: Introduction to Biomedical Image Analysis

Credits: 3

Total Enrollment:

Fall 2021: Graduate: 14, Undergraduate: 8

Fall 2020: Graduate: 13, Undergraduate: 12

Fall 2019: Graduate: 14, Undergraduate: 11

Fall 2018: Graduate: 25, Undergraduate: 3

Fall 2017: Graduate: 4, Undergraduate: 3

Fall 2016: Graduate: 20, Undergraduate: 1

Number of Lectures: 27 per semester (52 h contact, including 42 h teaching per semester)

Course Evaluation Score:

Fall 2021: .../5.0 (Course), .../5.0 (Instructor)

Fall 2020: 4.0/5.0 (Course), 3.9/5.0 (Instructor)

Fall 2019: 3.6/5.0 (Course), 3.1/5.0 (Instructor)

Fall 2018: 4.0/5.0 (Course), 4.3/5.0 (Instructor)

Fall 2017: 4.5/5.0 (Course), 4.6/5.0 (Instructor)

Fall 2016: 4.1/5.0 (Course), 3.9/5.0 (Instructor)

Washington University in St. Louis

May 2007 - Dec 2009: Instructor, Center for Sensor Signal and Information Processing, Electrical and Systems Engineering Department, Washington University in St. Louis.

Study Groups: Detection and Estimation Theory, Introduction to Mathematical Statistics, Linear Statistical Models, Multivariate Analysis, and Matrices.

Responsibilities: Teaching as well as assigning, grading, and correcting homework for junior graduate students. Preparing lecture notes on Introduction to Mathematical Statistics, Linear Statistical Models, and Multivariate Analysis.

Lectures for Continuing Medical Education Credits:

“Harnessing the Power of Artificial Intelligence in Renal Pathology,” 40 mins, *the United States and Canadian Academy of Pathology’s (USCAP’s) 109th Annual Meeting 2020, Los Angeles, CA*, Mar. 1, 2020.

“Computational Nephropathology: From Basics to Applications: Applications of Computational Pathology to Nephropathology Research - Part 2,” 1 h, Seminar in Nephropathology as part of a Joint Venture between *the Glomerular Disease Study & Trial Consortium (GlomCon) and the Renal Pathology Society (RPS)*, Jan. 27, 2020. Talk URL: https://youtu.be/Jj9Hrcldi_w

“Computational Nephropathology: From Basics to Applications: Applications of Computational Pathology to Nephropathology Research - Part 1,” 1 h, Seminar in Nephropathology as part of a Joint Venture between *the GlomCon and RPS*, Nov. 26, 2019. Talk URL: <https://youtu.be/BW1qoEwvg0A>

Research Supervision:

Post-Doctoral Trainees (1)

Brandon Ginley, PhD, Pathology and Anatomical Sciences, UB, 2021-Present.

PhD Students (5)

Nicholas Lucarelli, Pathology and Anatomical Sciences, UB, 2021-Present.

Accomplishment: Recipient of one of the three best abstract awards for *Pathologists in Training Best Abstract Award* by *Renal Pathology Society* for 2020-21. Publication includes one first-authored peer-reviewed conference proceeding article. Presentations include one platform talk and one first-authored poster presentation in national level conferences.

Samuel P. Border, Pathology and Anatomical Sciences, UB, 2020-Present.

Accomplishment: Awards include one travel award to attend a national level conference. One of the two runner-ups for the Best Poster award in *SPIE Medical Imaging – Digital Pathology 2020*. Publications include one first-authored journal review article and two first-authored peer-reviewed conference proceeding articles. Presentations include one platform talk and three first-authored poster presentations in national level conferences.

Brendon Lutnick, Pathology and Anatomical Sciences, UB, 2016-21.

Dissertation: *Improving the efficiency for segmentation of gigapixel sized digital pathology whole slide images*

Accomplishment: Awards include one travel award to attend a national level conference. Publications include two first-authored peer-reviewed journal articles, including one in *Nature Machine Intelligence* (IF: 15.51), and five first-authored peer-reviewed conference proceeding articles. Presentations include six platform talks and five first-authored poster presentations in national level conferences.

Joined Johnson & Johnson after the defense as a Data Scientist.

Darshana Govind, Pathology and Anatomical Sciences, UB, 2016-21.

Dissertation: *Integrating image analysis with omics data to study podocyte-specific changes in renal diseases*

Accomplishment: Awards include one travel award to attend a national level conference. Publications include three first-authored peer-reviewed journal articles, including one in the *Journal of American Society of Nephrology (JASN)* (IF: 10.12) and one in *Scientific Reports - Nature*, and four first-authored peer-reviewed conference proceeding articles. The *JASN* article has been selected to appear on the cover of their Nov. 2021 issue. Presentations include four platform talks and three first-authored poster presentations in national level conferences.

Joined Johnson & Johnson after the defense as a Data Scientist.

Brandon Ginley, Pathology and Anatomical Sciences, UB, 2016-21.

Dissertation: *Investigation of machine learning algorithms for pathologic assessment of digitized kidney biopsies*

Accomplishment: Awards include one travel award to attend a national level conference. Recipient of one of the three best abstract awards for *Pathologists in Training Best Abstract Award* by *Renal Pathology Society* for 2020-21. Publications include four first-authored peer-reviewed

journal articles, including two papers in the *JASN* and one in *Scientific Reports - Nature*, and four first-authored peer-reviewed conference proceeding articles. The *JASN* article has been selected for the *Best of ASN Journals: Clinical JASN and JASN* in 2019. Presentations include three platform talks and seven first-authored poster presentations in national level conferences.

Master's Students (5)

Neil Kavthekar, Biomedical Engineering, UB, 2020-Present.

Thesis (tentative): *Automated tubular morphometric visualization for whole kidney biopsy*

Accomplishment: Publication includes one first-authored peer-reviewed conference proceeding article. Presentations include two first-authored poster presentations in national level conferences.

Nicholas Lucarelli, Biomedical Engineering, UB, 2019-20.

Thesis: *Urinary proteomic guided discovery of digital morphologic biomarkers in diabetic nephropathy*

Avinash Kammardi Shashiprakash, Biomedical Engineering, UB, 2018-20.

Thesis: *A distributed system improves inter-observer and AI concordance in annotating interstitial fibrosis and tubular atrophy*

Accomplishment: Publications include one first-authored peer-reviewed conference proceeding article. Presentation includes one first-authored poster presentation in a national level conference.

Joined Caterpillar Inc. after the defense as a Data Scientist.

Leema Murali Krishna, Biomedical Engineering, UB, 2018-20.

Thesis: *Multi-compartment segmentation in renal transplant pathology*

Accomplishment: Publications include two first-authored peer-reviewed conference proceeding articles. Presentations include one first-authored platform talk and one first-authored poster presentation in national level conferences.

Joined Eisai Pharmaceutical Company after the defense as a Machine Learning Engineer.

Samuel P. Border, Biomedical Engineering, UB, 2018-19.

Thesis: *Exploring the utility of Bayesian Networks in histopathological image analysis: Beyond classifier networks*

Graduate Research Assistants (4)

Briana Santo, Pathology and Anatomical Sciences, UB, Aug. 2018 - Jul. 2021.

Accomplishment: Publications include one first-authored journal review article and one first-authored peer-reviewed conference proceeding article. Presentations include one platform talk and three first-authored poster presentations in national level conferences.

Aurijoy Majumder, Master's Student, Computer Science & Engineering, UB, Mar-Oct 2018.

Accomplishment: Published one first-authored peer-reviewed conference proceeding article. Presented a platform talk in a national level conference.

Research: Computational image analysis of diabetic nephropathy renal biopsies

Siddhartha Dhiman, Master's Student, Biomedical Engineering, UB, Jan. 2017 - Aug. 2018.

Accomplishment: Publication includes one first-authored peer-reviewed conference proceeding article. Presented one first-authored poster in a national level conference.

Research: Computational analysis of cerebrovascular structures imaged using two-photon microscopy

Joined Medical University of South Carolina after the defense as a Research Specialist.

Olivier Simon, Master's Student, Biomedical Engineering, UB, Feb-Dec 2017. [Olivier Simon had a prior PhD from Johns Hopkins University.]

Accomplishment: Publications include one first-authored peer-reviewed journal article in *Scientific Reports - Nature* and one first-authored peer-reviewed conference proceeding article. Presented a platform talk in a national level conference.

Research: Computational image analysis of diabetic nephropathy renal biopsies

Joined University of Colorado at Denver as a Post-Doctoral Research Associate after completion of his work with us.

PhD Thesis Examination Committees (excluding the cases of own students - 7)

Xuan Gong, Computer Science and Engineering, UB, 2021-Present.

Wenhan Zheng, Biomedical Engineering, UB, 2020-Present.

Krutika Patidar, Chemical and Biological Engineering, UB, 2020-Present.

Suresh Lakshmanan, Pathology and Anatomical Sciences, UB, 2019-Present.

Thesis: *Assessment of de novo donor specific antibodies in renal transplant candidates*

Jonathan Folmsbee, Biomedical Engineering, UB, 2018-Present.

Thesis: *Exploring image content spaces: Implications for training in computational pathology*

Sean D. McGarry, Biophysics, Medical College of Wisconsin, Wauwatosa, WI, 2018-20.

Thesis: *Predictive modeling of prostate cancer biomarkers with magnetic resonance imaging*

Joseph Costa, Pathology and Anatomical Sciences, UB, 2015-18.

Thesis: *No holds barred: Investigating the killing bite of the sabertooth cat Homotherium serum*

Master's Thesis & Project Examination Committees (excluding the cases of own students - 7)

Dhadma Balachandran, Biomedical Engineering, UB, 2020-Present.

Akshita Gupta, Biomedical Engineering, UB, 2018-19.

Project: *Ontological connections between the genotypic and phenotypic features in digital pathology images*

Siddhartha Dhiman, Biomedical Engineering, UB, 2017-18.

Thesis: *Role of nuclear-FGFR1 in schizophrenia and ontogenic genome programming - A computational study*

Maninderpal Singh Cheema, Biomedical Engineering, UB, 2017-18.

Thesis: *Task relevant source based brain computer interface: Exploration of independent component analysis based spatial filtering with reliability*

Ryan Therrien, Biomedical Engineering, UB, 2016-17.

Thesis: *Role of training data variability on classifier performance and generalizability*

Snehal Salunke, Biomedical Engineering, UB, 2016-17.

Thesis: *Data driven method for building 3D anatomical models*

Kritika Lakhotia, Biomedical Engineering, UB, 2015-16.

Thesis: *Visualization and quantification of 3D tumor-host interface architecture reconstructed from digital histopathology slide*

Rotation Students (1)

Dietta Chihade, PhD Program in Biomedical Sciences (PPBS), Jacobs School, UB, Nov-Dec 2020.

Training: Computational Image Analysis

Senior Design Project Supervision (1)

Matthew Adroved, Madison Addesa, Cristina Huyhua, and Anthony Romeo, Biomedical Engineering, UB, 2020-21.

Project: *Nuclei-lab: Matlab whole slide image nuclei characterization*

Undergraduate Research Trainees (10)

Conan Wang, Computer Science & Engineering, UB, Feb-Jun 2021.

Training: Computational Annotation of Large Histo-Pathology Images

Kyle Williams, Biomedical Engineering, UB, Oct-Dec 2020.

Training: Computational Pathology

Kathryn Maraszek, Biochemistry, UB, Jun. 2019 - Jun. 2020.

Program: Collaborative Learning and Integrated Mentoring in the Biosciences (CLIMB) Undergraduate Program (UP) for Summer Research (Summer 2019)

Training: Computational Pathology

Accomplishment: Awards include one travel award to attend a national level conference. Publication includes one first-authored peer-reviewed conference proceeding article. Presented one first-authored poster in a national level conference.

Joined the Cancer Sciences Ph.D. program at the Roswell Park Comprehensive Cancer Center after completion of her work with us.

Dylan Williams, Biomedical Engineering, UB, Nov. 2018 - Feb. 2019.

Training: Computational Pathology

Israh Ibrahim, Biology, Medaille College, Buffalo, NY, Summer 2017.

Program: CLIMB UP for Summer Research

Training: Computational Blood Smear Image Analytics

Brendon Lutnick, Biomedical Engineering, UB, Mar-Aug 2016.

Training: Multi-Resolution Segmentation of Medical Images

Brandon Ginley, Biomedical Engineering, UB, Jun. 2015 - Aug. 2016.

Program: UB Center for Undergraduate Research & Creative Activities (UB-CURCA)

Training: Microscopy Image Analysis

Julia Andrade Pessoa Morales, Biomedical Engineering, UB, Sep-Dec 2015.

Program: UB-CURCA

Training: Digital Image Processing & Analysis

Erika Decosty, Biomedical Engineering, UB, Jul-Dec 2015.

Program: UB-CURCA

Training: Digital Image Processing & Analysis

Vishal Suresh, Biomedical Engineering, UB, Jul-Dec 2015.

Program: UB-CURCA

Training: Digital Image Processing & Analysis

Grant Support:

Active (external & competitive)

Going Beyond Segmentation in Discovering Early Pixel Level Changes in Diabetic Nephropathy using Histology Image and Urinary Proteomics Data

Sponsor: Augusta University

Mechanism: Diabetic Complications Consortium (DiaComp) Pilot and Feasibility Program

Award Number: 32307-95

Total Budget: \$60,000

Total Direct Cost: \$39,768

Percent Effort: 3%

Award Period: 07/01/2021-06/30/2022

Role: PI

KULMAP: Human Kidney, Urinary Tract, and Lung Mapping Center

Sponsor: NIH - OD

Mechanism: The Human BioMolecular Atlas Program (HuBMAP)

Award Number: U54 HL145608 04S2

Total Budget: \$100,000

Total Direct Cost: \$100,000

Total UB's Amount: \$100,000

Total UB's Direct Cost: \$63,412

Percent Effort: 5%

Award Period: 07/12/2021-06/30/2022

Role: Co-I (PI: Kun Zhang, PhD, University of California at San Diego, Sanjay Jain, MD, PhD, Washington University in St. Louis)

A Computational Renal Pathology Suite for KPMP

Sponsor: University of Washington

Mechanism: The Kidney Precision Medicine Project (KPMP) Consortium Glue Grant

Total Budget: \$215,000

Total Direct Cost: \$138,253

Percent Effort: 5%

Award Period: 01/01/2020-07/31/2023

Role: PI

Computational Imaging of Renal Structures for Diagnosing Diabetic Nephropathy

Sponsor: NIH - NIDDK (Year 1-5), Office of the Director (Year 2 & 3 Supplements)

Mechanism: R01

Award Number: R01 DK114485

Total Budget: \$2,000,045

Total Direct Cost: \$1,346,978

Percent Effort: 12.58% (Year 1), 16.33% (Year 2 & 3), 20% (Year 4 & 5)

Award Period: 09/15/2018-07/31/2023

Role: PI

Note: Originally the R01 was awarded for \$1,485,400. On Year 1, the PI was invited to submit a supplementary competitive grant, and was awarded an additional \$299,645 for the Year 2. On Year 2, the PI was invited to submit a second supplementary competitive grant, and was awarded an additional \$215,000 for the Year 3.

Active (The State University of New York - internal & competitive)

Integrating Genomics and Image Features for Computational Prognostication of Diabetic Nephropathy

Sponsor: The State University of New York

Mechanism: Seed Grant Program

Award Number: RSG201047.2

Total Direct Cost: \$30,000

Percent Effort: 3%

Award Period: 10/15/2020-10/14/2022

Role: PI

Active (UB - internal & competitive)

A Framework for Fusing Histopathology and Genomics Features for Diabetes Diagnosis and Prognosis

Sponsor: Clinical & Translational Science Institute

Mechanism: Translational Pilot Studies

Total Direct Cost: \$42,500

Percent Effort: 3%

Award Period: 01/01/2021-12/31/2021

Role: PI

Active (UB - start-up)

Development of a Quantitative & Computational Imaging Program

Sponsor: Jacobs School

Total Direct Cost: \$500,000

Percent Effort: 3%

Award Period: 04/01/2015-03/31/2022

Role: PI

Under Review (external & competitive)

Ontology-Driven HuBMAP Data/Knowledge Standardization, Integration, and Analysis

Sponsor: NIH - OD

Mechanism: The Human BioMolecular Atlas Program (HuBMAP) Integration, Visualization & Engagement (HIVE) Collaboratory (OT2)

Total Budget: \$8,635,223

Total Direct Cost: \$7,463,910

Total University at Buffalo's Amount: \$2,175,995

Total University at Buffalo's Direct Cost: \$1,393,293

Total My Direct Cost: \$216,562

Percent Effort: 10%

Award Period: 02/01/2022-01/31/2026

Role: Co-I (MPIs: Yongqun He, PhD, University of Michigan, Alexander Diehl, PhD, University at Buffalo, Junguk Hur, PhD, University of North Dakota, Sanjay Jain, MD, PHD, Washington University in St. Louis, Christopher Mungall, PhD, University of California - Lawrence Berkeley Lab.)

A Computational IMage Analysis Platform (CIMAP) for HuBMAP

Sponsor: NIH - OD

Mechanism: The Human BioMolecular Atlas Program (HuBMAP) Integration, Visualization & Engagement (HIVE) Collaboratory (OT2)

Total Budget: \$14,890,729

Total Direct Cost: \$12,864,749

Percent Effort: 42%

Award Period: 07/01/2022-06/30/2026

Role: PI

Comparative Analysis of Expanded Reference Kidney Proteomics vs that in Kidneys from Diabetic Donors with and without Kidney Disease

Sponsor: NIH - OD

Mechanism: U01

Total Budget: \$1,940,000

Total Direct Cost: \$1,356,000

Total UB's Amount: \$419,625

Total UB's Direct Cost: \$263,088

Percent Effort: 5%

Award Period: 07/01/2022-06/30/2026

Role: Co-I (PI: Maryam Afkarian, MD, PhD, University of California at Davis.)

Coordinating and Data Management Center for Acquired Resistance to Therapy Network

Sponsor: NIH - NCI

Mechanism: U24

Total Budget: \$5,055,005

Total Direct Cost: \$3,028,757

Total UB's Amount: \$82,717

Total UB's Direct Cost: \$51,860

Percent Effort: 5%

Award Period: 09/01/2022-08/31/2027

Role: Co-I (MPIs: Alan Hutson, PhD, Song Liu, PhD, Martin Morgan, PhD, and David Goodrich, PhD, Roswell Park Comprehensive Cancer Center.)

Molecular Function of Six1 in Salivary Gland Homeostasis and Regeneration

Sponsor: NIH - NIDCR

Mechanism: Parent R01

Total Budget: \$3,483,892

Total Direct Cost: \$2,189,155

Total My Direct Cost: \$91,567

Percent Effort: 5%

Award Period: 07/01/2022-06/30/2027

Role: Co-I (PI: Rose-Ann Romano, PhD, University at Buffalo.)

The Kidney Tissue Atlas Coordinating Center (KTACC)

Sponsor: NIH - NIDDK

Mechanism: Kidney Precision Medicine Project 2.0 (KPMP 2.0)

Total Budget: \$10,497,537

Total Direct Cost: \$8,997,578

Total UB's Amount: \$675,163

Total UB's Direct Cost: \$452,803

Percent Effort: 10%

Award Period: 07/01/2022-06/30/2027

Role: Co-I (PI: Mathias Kretzler, MD, University of Michigan.)

A Multi-Scale Multi-Modal Approach to Data Annotation in Renal Pathology Informatics

Sponsor: NIH - OD

Mechanism: Bridge2AI Program (OT2)

Total Budget: \$25,549,258

Total Direct Cost: \$21,467,916

Percent Effort: 45%

Award Period: 02/01/2022-01/31/2026

Role: PI

OpenPath: Multi-institution Open Datasets and AI Platforms for Advancing Ethical and Trustworthy Computational Pathology in Research and Clinical Applications

Sponsor: NIH - OD

Mechanism: Bridge2AI Program (OT2)

Total Budget: \$27,695,330

Total Direct Cost: \$23,796,289

Total UB's Amount: \$943,790

Total UB's Direct Cost: \$593,583

Percent Effort: 30.33% (Year 1 & 2), 33.33% (Year 3 & 4)

Award Period: 02/01/2022-01/31/2026

Role: Co-I (MPIs: Anil Parwani, MD, PhD, Raghu Machiraju, PhD, Dhableswar Panda, PhD, Ohio State University, Lee Cooper, Northwestern University.)

Foundations Supporting Self-Learning and Clinically Validatable AI

Sponsor: NIH - OD

Mechanism: Bridge2AI Program (OT2)

Total Budget: \$35,972,044

Total Direct Cost: \$32,979,157

Total UB's Amount: \$882,169

Total UB's Direct Cost: \$554,949

Percent Effort: 33.33%

Award Period: 02/01/2022-01/31/2026

Role: Co-I (PI: Cody Bumgardner, PhD, University of Kentucky.)

A Cloud Based Distributed Tool for Computational Renal Pathology

Sponsor: NIH - NIDDK

Mechanism: R21 Exploratory/Developmental Research Grant

Impact Score: 31 (Impact score runs from 10 to 90, where 10 is best.)

Total Budget: \$478,710

Total Direct Cost: \$322,164

Percent Effort: 5%

Award Period: 04/01/2022-03/31/2024

Role: PI

Rapid Quantitative Renal Fibrosis Evaluation with Dual-Mode Microscopy

Sponsor: NIH - NIDDK

Mechanism: R01

Total Budget: \$3,143,238

Total Direct Cost: \$1,971,471

Total UB's Amount: \$605,691

Total UB's Direct Cost: \$411,508

Percent Effort: 15%

Award Period: 09/01/2021-08/31/2026

Role: Co-I (PI: Farzad Fereidouni, PhD, University of California at Davis.)

Revision Application in Preparation (external & competitive)

Computational Image Analysis of Renal Transplant Biopsies to Predict Graft Outcome

Sponsor: NIH - NIDDK

Mechanism: R01

Percentile from First Submission: 28
Total Budget: \$2,240,779 (tentative)
Total Direct Cost: \$1,658,635 (tentative)
Percent Effort: 10%
Award Period: 07/01/2022-06/30/2027 (tentative)
Role: PI

Completed (external & competitive)

Computational Analysis of Neutrophil Extracellular Traps in Lupus Nephritis Renal Biopsies

Sponsor: University of Pennsylvania
Mechanism: CKD Biomarkers Consortium Pilot and Feasibility Program
Total Budget: \$75,000
Total Direct Cost: \$48,067
Percent Effort: 3%
Award Period: 04/01/2019-07/31/2021
Role: PI

Computational Imaging of Renal Structures for Diagnosing Diabetic Nephropathy

Sponsor: Augusta University
Mechanism: Diabetic Complications Consortium (DiaComp) Pilot and Feasibility Program
Award Number: 32307-5
Total Budget: \$100,000
Total Direct Cost: \$64,827
Percent Effort: 5.33%
Award Period: 11/01/2017-10/31/2019
Role: PI

Completed (UB - internal & competitive)

Quantitative Study of NETs in Renal Pathobiology

Sponsor: Office of the Vice President for Research & Economic Development
Mechanism: Buffalo Blue Sky
Total Direct Cost: \$15,000
Percent Effort: 3%
Award Period: 11/15/2018-09/30/2021
Role: PI

Human-Artificial Intelligence Liaison (HAIL) for Renal Pathology

Sponsor: I-Corps Program
Stipend: \$1,000 (The stipend is to be used for customer discovery.)
Percent Effort: 3%
Award Period: No specified time limit.

Role: Technical & Entrepreneurial Lead

Automated Digital Image Analysis of Microscopic Renal Structures for Early Diagnosis of Proteinuric Renal Disease

Sponsor: Office of the Vice President for Research & Economic Development

Mechanism: Innovative Micro-Programs Accelerating Collaboration in Themes (IMPACT)

Total Direct Cost: \$25,000

Percent Effort: 5%

Award Period: 01/15/2017-06/30/2018

Role: PI

Career Citation Indices (Google Scholar): Citations: 1482, h-index: 18, i10-index: 24.

Note:

Gray text-box with 'UB' indicates work conducted at UB.

Underline indicates corresponding author.

† and ‡ indicate Dr. Sarder's graduate and undergraduate students, respectively.

Journal Articles (Peer-Reviewed):

Submitted

1. X. Zheng, L. Higdon, A. Gaudet, M. Shah, A. Balistieri, C. Li, P. Nadai, L. Palaniappan, X. Yang, B. Santo[†], B. Ginley[†], X. Wang, K. Myakala, P. Nallagatla, M. Levi, **P. Sarder**, A. Rosenberg, J. Maltzman, N. de Freitas Caires, and V. Bhalla, "Endothelial cell-specific molecule-1 inhibits albuminuria in diabetic mice," submitted to *Journal of the American Society of Nephrology*. **UB**
2. K. Myakala, X. X. Wang, B. Jones, M. Hirschev, X. Yang, A. Rosenberg, B. Ginley[†], **P. Sarder**, L. Brodsky, Y. Jang, C. H. Na, Y. Qi, X. Zhang, U. Guha, P. Lewien, C. Wu, S. Bansal, J. Ma, A. Cheema, J. Panov, and M. Levi, "NAD metabolism modulates mitochondrial function and inflammation and prevents progression of diabetic kidney disease," submitted to *Journal of the American Society of Nephrology*. **UB**
3. M. Andrews, T. Yoshida, C. Henderson, H. Pflaum, A. McGregor, J. Lieberman, I. de Boer, T. Vaisar, J. Himmelfarb, B. Kestenbaum, J. Y. Chung, S. Hewitt, B. Santo[†], B. Ginley[†], **P. Sarder**, A. Rosenberg, T. Murakami, J. Kopp, Z. Kuklenyik, and A. Hoofnagle, "Variant plasma apolipoprotein L1 associates with larger lipoprotein particles and exacerbates kidney injury," submitted to *Journal of the American Society of Nephrology*. **UB**
4. A. Sabharwal*, N. Kavthekar^{†,*}, J. Miecznikowski, M. Glogauer, A. Maddi, and **P. Sarder**, "Integrating machine learning and dental radiography for periodontal and peri-implant diagnosis," submitted to *Frontiers in Dental Medicine*. [*AS and NK contributed equally.] **UB**

In Revision

1. B. Lutnick[†], D. Manthey, J. U. Becker, B. Ginley[†], K. Moos, J. E. Zuckerman, L. Rodrigues, A. J. Gallan, L. Barisoni, C. E. Alpers, X. X. Wang, K. Myakala, B. A. Jones, M. Levi, J. B. Kopp, T. Yoshida, S. S. Han, S. Jain, A. Z. Rosenberg, K. Y. Jen, and **P. Sarder**, for the Kidney Precision Medicine Project, "A user-friendly tool for cloud-based whole slide image segmentation, with examples from renal histopathology," in revision for *Communications Medicine - Nature*. **UB**
2. U. Muhammad, Md. Z. Hoque, M. Oussalah, A. Keskinarkaus, T. Seppänenena, and **P. Sarder**, "A self-attention mechanism for COVID-19 detection using chest x-ray images," in revision for *Knowledge-Based Systems - Elsevier*. **UB**
3. B. A. Santo[†], D. Govind[†], P. Daneshpajouhnejad, X. Yang, X. X. Wang, K. Myakala, B. A. Jones, M. Levi, J. B. Kopp, L. J. Niedernhofer, D. Manthey, K. C. Moon, S. S. Han, J. Zee, A. Z. Rosenberg, and **P. Sarder**, "PodoCount: A robust, fully automated whole-slide podocyte quantification tool," in revision for *Kidney International Reports*. **UB**

Published/Accepted

1. B. Lutnick[†], L. K. Murali[†], B. Ginley[†], A. Z. Rosenberg, and **P. Sarder**, “Histo-fetch – On-the-fly processing of gigapixel whole slide images simplifies and speeds neural network training,” to appear in *Journal of Pathology Informatics*. **UB**
2. D. Govind[†], J. U. Becker, J. Miecznikowski, A. Z. Rosenberg, J. Dang, P. L. Tharaux, R. Yacoub, F. Thaiss, P. F. Hoyer, D. Manthey, B. Lutnick[†], A. M. Worrall, I. Mohammad, V. Walavalkar, J. E. Tomaszewski, K. Y. Jen, and **P. Sarder**, “PodoSighter: A cloud-based tool for label-free podocyte detection in kidney whole slide images,” *Journal of the American Society of Nephrology*, vol. 32, no. 11, pp. 2795-2813, Nov. 2021. [Selected to be on the cover of the respective issue.] **UB**
3. B. Ginley^{†*}, K. Y. Jen^{*}, S. S. Han, L. Rodrigues, S. Jain, A. Fogo, J. Zuckerman, V. Walavalkar, J. Miecznikowski, Y. Wen, F. Yen, D. Yun, K. C. Moon, A. Rosenberg, C. Parikh, and **P. Sarder**, “Automated computational detection of interstitial fibrosis, tubular atrophy, and glomerulosclerosis,” *Journal of the American Society of Nephrology*, vol. 32, no. 4, pp. 837-50, Apr. 2021. [*BG and KYJ contributed equally. Featured article of the respective issue. Editorial on this article: J. B. Hodgin and L. H. Mariani, “Automated quantification of chronic changes in the kidney biopsy: Another step in the right direction,” *Journal of the American Society of Nephrology*, vol. 32, no. 4, pp. 767-68, Apr. 2021.] **UB**
4. D. Govind^{†*}, K. Y. Jen^{*}, K. Matsukuma, G. Gao, K. A. Olson, D. Gui, G. Wilding, S. P. Border[†], and **P. Sarder**, “Improving the accuracy of gastrointestinal neuroendocrine tumor grading with deep learning,” *Scientific Reports - Nature*, vol. 10, pp. 11064:1–12, Jul. 2020. [*DG and KYJ contributed equally.] **UB**
5. B. Ginley[†], B. Lutnick[†], K. Y. Jen, A. Fogo, S. Jain, A. Rosenberg, V. Walavalkar, G. Wilding, J. E. Tomaszewski, R. Yacoub, G. M. Rossi, and **P. Sarder**, “Computational segmentation and classification of diabetic glomerulosclerosis,” *Journal of the American Society of Nephrology*, vol. 30, no. 10, pp. 1953-67, Oct. 2019. [Featured article of the respective issue. The article was selected for the *Best of American Society of Nephrology (ASN) Journals: Clinical Journal of ASN (CJASN) & JASN* in 2019. Editorial on this article: K. V. Lemley, “Machine learning comes to nephrology,” *Journal of the American Society of Nephrology*, vol. 30, no. 10, pp. 1780-81, Oct. 2019.] **UB**
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Book Chapters (Peer-Reviewed):

1. S. T. Narla, B. Decker, **P. Sarder**, E. Stachowiak, and M. Stachowiak, “Induced pluripotent stem cells reveal common neurodevelopmental genome deprogramming in schizophrenia,” in *Human Neural Stem Cells*, (pp. 137–62, L. Buzanska, Ed.,) *Results and Problems in Cell Differentiation*, vol. 66, Springer, Cham, 2018. **UB**
2. **P. Sarder**, W. Zhang, J. P. Cobb, and A. Nehorai, “Gene reachability using Page ranking on gene co-expression networks,” in *Link Mining: Models, Algorithms, and Applications*, (Ch. 21, pp. 557–568, P. S. Yu, J. Han, and C. Faloutsos, Eds.,) Springer, New York, 2010.

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1. S. P. Border[†] and **P. Sarder**, “From what to why, the growing need for a focus shift towards explainability of AI in digital pathology,” to appear in *Frontiers in Physiology*. **UB**
2. **P. Sarder** and A. Nehorai, “Deconvolution methods for 3D fluorescence microscopy images: An overview,” *IEEE Signal Processing Magazine*, vol. 23, no. 3, pp. 32–45, May 2006. [Wrote the manuscript. “Sarder and Nehorai review perhaps the most heavily studied signal processing topic related to fluorescence microscopy: the deconvolution of images to remove blurring inherent in microscope image acquisition.” —J. Kovačević and R. F. Murphy (commented in their article, “Molecular and cellular bioimaging,” *IEEE Signal Processing Magazine*, vol. 23, no. 3, p. 19, May 2006).]

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1. L. Rodrigues, **P. Sarder**, K. Y. Jen, B. Ginley[†], J. Pratas, V. Sousa, A. Figueiredo, and R. Alves, “The rediscovery of nephropathology with artificial intelligence,” *Portuguese Journal of Nephrology and Hypertension*, vol. 34, no. 4, pp. 195–97, Jan. 2021. **UB**
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Conference Papers (Peer Reviewed & Published):

1. B. Lutnick[†], D. Manthey, J. U. Becker, J. Zuckerman, L. Rodrigues, K. Y. Jen, and **P. Sarder**, “A cloud-based tool for federated segmentation of whole slide images,” *Proc. of SPIE–Medical Imaging 2022: Digital & Computational Pathology*, vol. 12039, pp. 1203951:X–X, San Diego, CA, Feb. 2022. **UB**
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3. N. Lucarelli[†], D. Yun, D. Han, B. Ginley[†], K. C. Moon, A. Rosenberg, J. E. Tomaszewski, S. S. Han, and **P. Sarder**, “Computational integration of renal histology and urinary proteomics using deep learning regression,” *Proc. of SPIE–Medical Imaging 2022: Digital & Computational Pathology*, vol. 12039, pp. 1203931:X–X, San Diego, CA, Feb. 2022. **UB**
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35. **P. Sarder** and A. Nehorai, “Performance analysis of quantifying fluorescence of target-captured microparticles from microscopy images,” *Proc. Fourth IEEE Workshop on Sensor Array and Multi-Channel Processing*, pp. 289–293, Waltham, MA, Jul. 2006.

Other Professional Presentations:

Conference Abstracts

1. B. Lutnick[†], D. Manthey, J. U. Becker, J. Zuckerman, L. Rodrigues, K. Y. Jen, and **P. Sarder**, “A cloud-based tool for federated segmentation of whole slide images,” *SPIE–Medical Imaging 2022: Digital & Computational Pathology*, San Diego, CA, Feb. 20-21, 2022. [Selected for a poster presentation by Mr. B. Lutnick.] **UB**
2. N. Kavthekar[†], B. Ginley[†], S. P. Border[†], N. Lucarelli[†], K. Y. Jen, and **P. Sarder**, “Automated tubular morphometric visualization for whole kidney biopsy,” *SPIE–Medical Imaging 2022: Digital & Computational Pathology*, San Diego, CA, Feb. 20-21, 2022. [Selected for a poster presentation by Mr. N. Kavthekar.] **UB**
3. N. Lucarelli[†], D. Yun, D. Han, B. Ginley[†], K. C. Moon, A. Rosenberg, J. E. Tomaszewski, S. S. Han, and **P. Sarder**, “Computational integration of renal histology and urinary proteomics using deep learning regression,” *SPIE–Medical Imaging 2022: Digital & Computational Pathology*, San Diego, CA, Feb. 20-21, 2022. [Selected for a platform presentation by Mr. N. Lucarelli.] **UB**
4. S. P. Border[†], B. Ginley[†], J. E. Tomaszewski, and **P. Sarder**, “HistoLens: A stand-alone tool for quantitative feature visualization of glomerular histology images,” *SPIE–Medical Imaging 2022: Digital & Computational Pathology*, San Diego, CA, Feb. 20-21, 2022. [Selected for a platform presentation by Mr. S. P. Border.] **UB**
5. D. Govind[†], S. Meamardoost, R. Yacoub, R. Gunawan, J. E. Tomaszewski, and **P. Sarder**, “Integrating image analysis with single cell RNA-seq data to study podocyte-specific changes in diabetic kidney disease,” *SPIE–Medical Imaging 2022: Digital & Computational Pathology*, San Diego, CA, Feb. 20-21, 2022. [Selected for a platform presentation by Ms. D. Govind.] **UB**
6. B. Ginley[†], N. S. Kavthekar[†], N. Lucarelli[†], B. A. Santo[†], K. Y. Jen, and **P. Sarder**, “Automated tubular morphometric analysis in kidney biopsies,” *ASN Kidney Week 2021*, Online (due to COVID-19 pandemic), Nov. 2-7, 2021. [Selected for a poster presentation by Mr. N. S. Kavthekar.] **UB**
7. B. Lutnick[†], A. Z. Rosenberg, L. Barisoni, C. E. Alpers, Y. Chen, A. Janowczyk, A. Madabhushi, J. Torrealba, A. Weins, I. E. Stillman, L. C. Herlitz, L. Rodrigues, J. E. Zuckerman, S. Jain, U. G. Balis, K. Y. Jen, and **P. Sarder**, for the Kidney Precision Medicine Project, “Computational quantification of IFTA for CKD cases of Kidney Precision Medicine Project,” *ASN Kidney Week 2021*, Online (due to COVID-19 pandemic), Nov. 2-7, 2021. [Selected for a platform presentation by Mr. B. Lutnick.] **UB**
8. **P. Sarder**, Y. Chen, B. Ginley[†], A. Z. Rosenberg, A. Janowczyk, B. Lutnick[†], N. Lucarelli[†], C. E. Alpers, S. Jain, S. Grewenow, B. Steck, L. Barisoni, A. Madabhushi, and U. G. Balis, for the Kidney Precision Medicine Project, “Prognostic glomerular morphometric phenotype discovery via clustering across large datasets,” *ASN Kidney Week 2021*, Online (due to COVID-19 pandemic), Nov. 2-7, 2021. **UB**
9. J. U. Becker, B. Lutnick[†], B. Ginley[†], and **P. Sarder**, “Automatic segmentation of arteries, arterioles, and glomeruli in renal biopsies with thrombotic microangiopathies,” *Annual Meeting of the German Society of Nephrology*, Rostock, Germany, Sep. 23-26, 2021. [Recipient of the best abstract award.] **UB**
10. J. U. Becker, B. Lutnick[†], J. J. Roelofs, J. Kers, S. Sciascia, S. V. Seshan, P. A. Cicalese, and **P. Sarder**, “Automatic segmentation of arteries, arterioles and glomeruli on kidney biopsies with thrombotic microangiopathies,” *The 11th Bari International Conference*, Venice, Italy, Sep. 18, 2021. **UB**

11. **P. Sarder**, “A user-friendly tool for cloud-based whole slide image segmentation, with examples from renal histopathology,” *The International Society for Magnetic Resonance in Medicine Workshop on Kidney MRI Biomarkers: The Route to Clinical Adoption*, Philadelphia, PA, Sep. 10, 2021. **UB**
12. B. Lutnick[†], K. Moos, S. V. Seshan, J. Kers, J. J. Roelofs, M. Hellmich, S. Sciascia, P. A. Cicalese, B. Ginley[†], **P. Sarder**, and J. U. Becker, “Automatic segmentation of arteries, arterioles and glomeruli in native biopsies with thrombotic microangiopathy and other vascular diseases,” *58th ERA-EDTA Congress*, Online, Jun. 5-8, 2021. **UB**
13. B. Santo[†], X. Jin, and **P. Sarder**, “A novel approach for computational classification of pancreatobiliary cytopathology,” *the USCAP 110th Annual Meeting 2021*, Online (due to COVID-19 pandemic), Mar. 13-18, 2021. [Selected for a poster presentation by Ms. B. Santo.] **UB**
14. N. Lucarelli[†], B. Ginley[†], S. S. Han, and **P. Sarder**, “Urinary proteomics data guides AI to discover new digital biomarkers for diabetic nephropathy classification,” *the USCAP 110th Annual Meeting 2021*, Online (due to COVID-19 pandemic), Mar. 13-18, 2021. [Selected for a poster presentation by Mr. N. Lucarelli. Selected as one of the three best abstract awards for *Pathologists in Training Best Abstract Award* by *Renal Pathology Society* for 2020-21.] **UB**
15. K. Y. Jen*, L. K. Murali^{†,*}, B. Lutnick[†], B. Ginley[†], D. Govind[†], H. Mori, G. Gao, and **P. Sarder**, “Multi-compartment segmentation in renal transplant pathology,” *SPIE–Medical Imaging 2021: Digital & Computational Pathology*, San Diego, CA, Feb. 14-15, 2021. [Selected for a poster presentation by Ms. L. K. Murali. *KYJ and LKM contributed equally.] **UB**
16. A. K. Shashiprakash[†], B. Lutnick[†], B. Ginley[†], D. Govind[†], N. Lucarelli[†], K. Y. Jen, A. Rosenberg, A. Urisman, V. Walavalkar, J. Zuckerman, M. Delsante, M. L. Z. Bissonnette, J. E. Tomaszewski, D. Manthey, and **P. Sarder**, “A distributed system improves inter-observer and AI concordance in annotating interstitial fibrosis and tubular atrophy,” *SPIE–Medical Imaging 2021: Digital & Computational Pathology*, San Diego, CA, Feb. 14-15, 2021. [Selected for a poster presentation by Mr. A. K. Shashiprakash.] **UB**
17. B. Lutnick[†], A. K. Shashiprakash[†], D. Manthey, and **P. Sarder**, “User friendly, cloud based, whole slide image segmentation,” *SPIE–Medical Imaging 2021: Digital & Computational Pathology*, San Diego, CA, Feb. 14-15, 2021. [Selected for a platform presentation by Mr. B. Lutnick.] **UB**
18. D. Govind[†], B. Santo[†], B. Ginley[†], R. Yacoub, A. Rosenberg, K. Y. Jen, V. Walavalkar, G. Wilding, A. Worrall, I. Mohammad, and **P. Sarder**, “Automated detection and quantification of Wilms’ Tumor 1-positive cells in murine diabetic kidney disease,” *SPIE–Medical Imaging 2021: Digital & Computational Pathology*, San Diego, CA, Feb. 14-15, 2021. [Selected for a platform presentation by Ms. D. Govind.] **UB**
19. B. Ginley[†], K. Y. Jen, A. Z. Rosenberg, and **P. Sarder**, “Prognostic glomerular morphometric phenotype discovery via clustering across large datasets,” *ASN Kidney Week 2020*, Online (due to COVID-19 pandemic), Oct. 22-25, 2020. [Selected for a poster presentation by Mr. B. Ginley. Selected as one of the three best abstract awards for *Pathologists in Training Best Abstract Award* by *Renal Pathology Society* for 2020-21.] **UB**
20. S. P. Border[†], B. Ginley[†], M. Delsante, A. Rosenberg, and **P. Sarder**, “Automating peritubular capillary inflammation scoring,” *the USCAP 109th Annual Meeting 2020*, Los Angeles, CA, Feb. 29 to Mar. 5, 2020. [Selected for a poster presentation by Ms. S. P. Border.] **UB**
21. B. Santo[†], A. Rosenberg, and **P. Sarder**, “Automated podocyte quantification for evaluation of chronic kidney disease,” *the USCAP 109th Annual Meeting 2020*, Los Angeles, CA, Feb. 29 to Mar. 5, 2020. [Selected for a platform presentation by Ms. B. Santo.] **UB**

22. B. Lutnick[†], K. Y. Jen, J. E. Tomaszewski, A. Rosenberg, and **P. Sarder**, “Removal of autopsy artifacts from whole slide images using unpaired adversarial training,” *the USCAP 109th Annual Meeting 2020*, Los Angeles, CA, Feb. 29 to Mar. 5, 2020. [Selected for a poster presentation by Mr. B. Lutnick.] **UB**
23. D. Govind[†], K. Y. Jen, and **P. Sarder**, “Deep learning-based tool for automated gastrointestinal neuroendocrine tumor detection and grading,” *the USCAP 109th Annual Meeting 2020*, Los Angeles, CA, Feb. 29 to Mar. 5, 2020. [Selected for a poster presentation by Ms. D. Govind.] **UB**
24. B. Ginley[†], K. Y. Jen, A. Rosenberg, G. M. Rossi, A. Fogo, S. Jain, and **P. Sarder**, “Automated computational classification of renal biopsies in lupus nephritis,” *the USCAP 109th Annual Meeting 2020*, Los Angeles, CA, Feb. 29 to Mar. 5, 2020. [Selected for a poster presentation by Mr. B. Ginley.] **UB**
25. B. Ginley[†], P. Daneshpajouhnejad, M. Komuraiah, X. Wang, M. Levi, A. Rosenberg, and **P. Sarder**, “Computational prediction of murine proteinuria using histological features of glomeruli,” *the USCAP 109th Annual Meeting 2020*, Los Angeles, CA, Feb. 29 to Mar. 5, 2020. [Selected for a poster presentation by Mr. B. Ginley.] **UB**
26. D. Govind[†], K. Y. Jen, and **P. Sarder**, “Deep learning-based automated hot-spot detection and tumor grading in human gastrointestinal neuroendocrine tumor,” *SPIE Medical Imaging–Digital Pathology*, Houston, TX, Feb. 19-20, 2020. [Selected for a platform presentation by Ms. D. Govind.] **UB**
27. L. K. Murali[†], B. Ginley[†], B. Lutnick[†], J. E. Tomaszewski, and **P. Sarder**, “Generative modeling for renal microanatomy,” *SPIE Medical Imaging–Digital Pathology*, Houston, TX, Feb. 19-20, 2020. [Selected for a platform presentation by Ms. L. K. Murali.] **UB**
28. K. E. Maraszek[‡], B. Santo[†], J. E. Tomaszewski, and **P. Sarder**, “The presence and location of podocytes in glomeruli as affected by diabetes mellitus,” *SPIE Medical Imaging–Digital Pathology*, Houston, TX, Feb. 19-20, 2020. [Selected for a poster presentation by Ms. K. E. Maraszek. Ms. Maraszek received a travel award to attend the conference.] **UB**
29. S. P. Border[†], K. Y. Jen, J. E. Tomaszewski, and **P. Sarder**, “Probabilistic modelling of diabetic nephropathy progression,” *SPIE Medical Imaging–Digital Pathology*, Houston, TX, Feb. 19-20, 2020. [Selected for a poster presentation by Mr. S. P. Border. Recipient of one of the two runner-ups for the best poster award.] **UB**
30. B. Santo[†], B. H. Segal, J. E. Tomaszewski, I. Mohammad, A. Worrall, S. Jain, and **P. Sarder**, “Neutrophil Extracellular Traps (NETs): an unexplored territory in renal pathobiology, a pilot computational study,” *SPIE Medical Imaging–Digital Pathology*, Houston, TX, Feb. 19-20, 2020. [Selected for a poster presentation by Ms. B. Santo.] **UB**
31. B. Ginley[†], K. Y. Jen, A. Rosenberg, G. M. Rossi, S. Jain, and **P. Sarder**, “Fully automated classification of glomerular lesions in lupus nephritis,” *SPIE Medical Imaging–Digital Pathology*, Houston, TX, Feb. 19-20, 2020. [Selected for a poster presentation by Mr. B. Ginley.] **UB**
32. B. Lutnick[†], B. Ginley[†], K. Y. Jen, W. Dong, and **P. Sarder**, “Generative modeling for label-free glomerular modeling and classification,” *SPIE Medical Imaging–Digital Pathology*, Houston, TX, Feb. 19-20, 2020. [Selected for a platform presentation by Mr. B. Lutnick.] **UB**
33. B. Santo[†], A. Z. Rosenberg, P. Daneshpajouhnejad, and **P. Sarder**, “Whole-slide podocyte quantification in renal tissue via p57 immunohistochemistry,” *ASN Kidney Week 2019*, Washington, DC, Nov. 7-10, 2019. [Selected for a poster presentation by Ms. B. Santo.] **UB**

34. B. Lutnick[†], B. Ginley[†], K. Y. Jen, S. Jain, and **P. Sarder**, “Unsupervised modeling of glomeruli for diabetic nephropathy staging in renal biopsies,” *ASN Kidney Week 2019*, Washington, DC, Nov. 7-10, 2019. [Selected for a poster presentation by Mr. B. Lutnick. Mr. Lutnick received a travel award to attend the conference.] **UB**
35. S. P. Border[†], K. Y. Jen, S. Jain, A. B. Fogo, J. E. Tomaszewski, and **P. Sarder**, “Analyzing the influence of glomerulus structural features using minimum spanning trees,” *ASN Kidney Week 2019*, Washington, DC, Nov. 7-10, 2019. [Selected for a poster presentation by Mr. S. P. Border. Mr. Border received a travel award to attend the conference.] **UB**
36. B. Ginley[†], B. Lutnick[†], K. Y. Jen, A. B. Fogo, S. Jain, A. Z. Rosenberg, V. Walavalkar, J. E. Tomaszewski, G. M. Rossi, and **P. Sarder**, “Contribution of glomerular phenotype to digital classification of diabetic nephropathy,” *ASN Kidney Week 2019*, Washington, DC, Nov. 7-10, 2019. [Selected for a poster presentation by Mr. B. Ginley. Mr. Ginley received a travel award to attend the conference.] **UB**
37. B. Santo[†], B. Ginley[†], B. Lutnick[†], S. Jain, B. H. Segal, J. E. Tomaszewski, and **P. Sarder**, “Neutrophil extracellular trap (NET) quantification in lupus nephritis potentiates NETs as a prognostic biomarker,” *ASN Kidney Week 2019*, Washington, DC, Nov. 7-10, 2019. [Selected for a poster presentation by Ms. B. Santo.] **UB**
38. D. Govind[†], K. Y. Jen, K. Matsukuma, G. Gao, K. A. Olson, D. Gui, and **P. Sarder**, “SKIE: An automated approach to quantitation of Ki-67 index from human gastrointestinal neuroendocrine tumor,” *the North American Neuroendocrine Tumor Society 2019 Annual Symposium and Meeting*, Boston, MA, Oct. 3-5, 2019. [Selected for a platform and poster presentations by Ms. D. Govind. The poster was selected as a featured poster, and Ms. Govind received travel award to attend the meeting.] **UB**
39. B. Ginley[†], B. Lutnick[†], K. Y. Jen, S. Jain, A. Rosenberg, and **P. Sarder**, “Computational image analysis of renal pathology biopsies,” *Kidney Precision Medicine Project (KPMP) Consortium Face-to-Face Meeting*, Washington, DC, Sep. 24-25, 2019. **UB**
40. A. Majumder[†], K. Y. Jen, S. Jain, J. E. Tomaszewski, and **P. Sarder**, “Examining structural patterns and causality in diabetic nephropathy using inter-glomerular distance and Bayesian graphical models,” *SPIE Medical Imaging–Digital Pathology*, San Diego, CA, Feb. 20-21, 2019. [Selected for a platform presentation by Mr. A. Majumder.] **UB**
41. S. Dhiman[†], I. Singh, and **P. Sarder**, “Computational analysis of cerebrovascular structures imaged using two-photon microscopy,” *SPIE Medical Imaging–Digital Pathology*, San Diego, CA, Feb. 20-21, 2019. [Selected for a poster presentation by Mr. S. Dhiman.] **UB**
42. K. Y. Jen, B. Ginley[†], B. Lutnick[†], J. E. Tomaszewski, and **P. Sarder**, “Deep learning for segmentation of glomeruli and tubular atrophy in renal biopsies,” *ASN Kidney Week 2018*, San Diego, CA, Oct. 26-28, 2018. **UB**
43. B. Ginley[†], B. Lutnick[†], D. Govind[†], R. Yacoub, K. Y. Jen, S. Jain, J. E. Tomaszewski, and **P. Sarder**, “Towards computationally assisted evaluation in renal histology,” *Renal Imaging Workshop - The National Institute of Diabetes and Digestive and Kidney Diseases 2018*, Bethesda, MD, Jul. 12-13, 2018. **UB**
44. E. Stachowiak, L. Chue, A. Dimitri, S. Narla, C. Benson, S. Dhiman, **P. Sarder**, and M. Stachowiak, “Delineation of neuro-ontogenic mechanisms of schizophrenia using induced pluripotent stem cells (iPSCs),” *World Conference of Neurology and Mental Disorders*, Rome, Italy, May 14-16, 2018. **UB**

45. D. Govind[†] and **P. Sarder**, “Glomerular boundary detection from multimodal microscopy images using Butterworth band-pass filter,” *SPIE Medical Imaging: Digital Pathology*, Houston, TX, Feb. 11-12, 2018. [Selected for a poster presentation by Ms. D. Govind.] **UB**
46. B. Lutnick[†], R. Yacoub, K. Y. Jen, J. E. Tomaszewski, S. Jain, and **P. Sarder**, “Deep variational auto-encoders for unsupervised glomerular classification,” *SPIE Medical Imaging: Digital Pathology*, Houston, TX, Feb. 11-12, 2018. [Selected for a platform presentation by Mr. B. Lutnick.] **UB**
47. O. Simon[†], R. Yacoub, S. Jain, J. E. Tomaszewski, and **P. Sarder**, “Examining structural changes in diabetic nephropathy using inter-nuclear distances in glomeruli,” *SPIE Medical Imaging: Digital Pathology*, Houston, TX, Feb. 11-12, 2018. [Selected for a platform presentation by Dr. O. Simon.] **UB**
48. B. Ginley[†], J. E. Tomaszewski, K. Y. Jen, A. Fogo, S. Jain, and **P. Sarder**, “Computational analysis of the structural progression of human diabetic nephropathy glomeruli,” *SPIE Medical Imaging: Digital Pathology*, Houston, TX, Feb. 11-12, 2018. [Selected for a platform presentation by Mr. B. Ginley.] **UB**
49. K. Black, M. Zhou, **P. Sarder**, M. Kuchuk, A. Al-Yasiri, S. Gunsten, K. Liang, H. Hennkens, W. Akers, R. Laforest, S. Brody, C. Cutler, and S. Achilefu, “Dual-radiolabeled nanoparticle probes for depth-independent *in vivo* imaging of enzyme activation,” *SPIE BiOS-Reporters, Markers, Dyes, Nanoparticles, and Molecular Probes for Biomedical Applications X*, San Francisco, CA, Jan. 29-30, 2018.
50. B. Lutnick[†], R. Yacoub, K. Y. Jen, J. E. Tomaszewski, S. Jain, and **P. Sarder**, “Cross-species knowledge transfer between murine and human histopathology using artificial intelligence,” *Visualization and Data Analysis 2018*, Burlingame, CA, Jan. 28 to Feb. 2, 2018. [Selected for a platform and poster presentations by Mr. B. Lutnick.] **UB**
51. A. Dimitri, L. Chuye, S. Dhiman, **P. Sarder**, M. Stachowiak, and E. Stachowiak, “iPSC derived cerebral organoids reveal early developmental malformations in schizophrenia,” *American Society for Cell Biology | European Molecular Biology Organization 2017*, Philadelphia, PA, Dec. 2-6, 2017. **UB**
52. L. Chuye, A. Dimitri, S. Narla, C. Benson, S. Dhiman, **P. Sarder**, E. Stachowiak, M. Stachowiak, “Delineation of neuro-ontogenic mechanisms of schizophrenia using induced pluripotent stem cells (iPSCs),” *American Society for Cell Biology | European Molecular Biology Organization 2017*, Philadelphia, PA, Dec. 2-6, 2017. **UB**
53. **P. Sarder**, R. Yacoub, and J. E. Tomaszewski, “Estimating microscopic structures of glomeruli in renal pathology,” *Translational Science 2017*, Washington, DC, Apr. 19-21, 2017. **UB**
54. B. Lutnick[†], J. E. Tomaszewski, and **P. Sarder**, “Leveraging unsupervised training sets for multi-scale compartmentalization in renal pathology,” *SPIE Medical Imaging: Digital Pathology*, Orlando, FL, Feb. 12-13, 2017. [Selected for a platform presentation by Mr. B. Lutnick.] **UB**
55. B. Ginley[†], J. E. Tomaszewski, and **P. Sarder**, “Automatic computational labeling of glomerular textural boundaries,” *SPIE Medical Imaging-Digital Pathology*, Orlando, FL, Feb. 12-13, 2017. [Selected for a platform presentation by Mr. B. Ginley.] **UB**
56. B. Ginley[†], T. Emmons, P. Sasankan, C. Urban, B. H. Segal, and **P. Sarder**, “Identification and characterization of neutrophil extracellular trap shapes in flow cytometry,” *SPIE Medical Imaging-Digital Pathology*, Orlando, FL, Feb. 12-13, 2017. [Selected for a platform presentation by Mr. B. Ginley.] **UB**

57. B. Lutnick[†], J. E. Tomaszewski, R. Yacoub, B. Ginley[†], and **P. Sarder**, “Unsupervised multi-scale glomerular compartmentalization in renal pathology,” *2016 Pathology Visions*, San Diego, CA, Oct. 23-25, 2016. [Selected for a poster presentation by Mr. B. Lutnick.] **UB**
58. B. Ginley[†], J. E. Tomaszewski, and **P. Sarder**, “Automatic labeling of glomeruli to aid renal histopathology,” *2016 Pathology Visions*, San Diego, CA, Oct. 23-25, 2016. [Selected for a poster presentation by Mr. B. Ginley.] **UB**
59. B. Ginley[†], T. Emmons, C. Urban, B. H. Segal, and **P. Sarder**, “A novel approach for automated detection of neutrophil extracellular traps,” *2016 Pathology Visions*, San Diego, CA, Oct. 23-25, 2016. [Selected for a poster presentation by Mr. B. Ginley.] **UB**
60. P. Sasankan, B. Ginley[†], M. J. Grimm, **P. Sarder**, and B. H. Segal, “Neutrophil extracellular traps: Digital quantification and role in antifungal host defense,” *Buffalo Niagara Medical Campus Extramural Biomedical Research Conference*, Buffalo, NY, Aug. 5, 2016. **UB**
61. B. Ginley[†], P. Tripathi, F. Chen, E. Anand, J. E. Tomaszewski, and **P. Sarder**, “Automated quantification of glomeruli features in renal pathology,” *SPIE Medical Imaging–Digital Pathology*, San Diego, CA, Feb. 27 to Mar. 3, 2016. **UB**
62. D. Maji, M. Zhou, **P. Sarder**, M. Shokeen, J. Culver, and S. Achilefu, “Quantitative fluorescence molecular tomography for *in vivo* measurement of targeted and activatable near infrared fluorescent molecular probes,” *2015 Biomedical Engineering Society’s Annual Meeting*, Tampa, FL, Oct. 7-10, 2015.
63. S. Elahi, S. Narla, C. Benson, B. Birkaya, **P. Sarder**, B. Ginley[†], M. Stachowiak, and E. Stachowiak, “Modeling human neurodevelopmental disorders with iPSC-derived 3D-cerebral organoids,” *4th Annual WNYSTEM Stem Cell Symposium*, Buffalo, NY, Jun. 12, 2015.
64. S. Narla, B. Birkaya, K. Brennan, C. Benson, S. Elahi, **P. Sarder**, M. Stachowiak, and E. Stachowiak, “Utilizing induced pluripotent stem cells (iPSCs) to delineate the neurodevelopmental genomic base of schizophrenia,” *4th Annual WNYSTEM Stem Cell Symposium*, Buffalo, NY, Jun. 12, 2015.
65. R. Gilson, R. Tang, **P. Sarder**, and S. Achilefu, “Time-dependent intracellular association of photosensitizers with organelles modulates the efficacy of photodynamic therapy,” *37th Meeting of the American Society for Photobiology*, San Diego, CA, Jun. 14-19, 2014.
66. E. Ringhausen, **P. Sarder**, T. Wang, K. Gullicksrud, S. Mondal, S. Achilefu, and W. Akers, “Clinical feasibility of optical projection of acquired luminescence for sentinel lymph node biopsy,” *Society of Nuclear Medicine and Molecular Imaging–2014 Annual Meeting*, St. Louis, MO, Jun. 7-11, 2014.
67. D. Hu*, **P. Sarder***, P. Ronhovde, S. Orthaus, S. Achilefu, and Z. Nussinov, “Automatic segmentation of fluorescence lifetime microscopy images of cells using multi-resolution community detection,” *SPIE BiOS–Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXI*, San Francisco, CA, Feb. 1-6, 2014. [*DH and PS contributed equally.]
68. D. Maji, M. Zhou, **P. Sarder**, and S. Achilefu, “Novel copper quenched fluorescent activatable molecular probes,” *SPIE BiOS–Reporters, Markers, Dyes, Nanoparticles, and Molecular Probes for Biomedical Applications*, San Francisco, CA, Feb. 1-6, 2014.
69. **P. Sarder**, S. Yazdanfar, W. Akers, G. Sudlow, C. Egbulefu, and S. Achilefu, “Comparison of near-infrared confocal and multiphoton microscopy modalities in deep tissue imaging using cyanine contrast agents,” *SPIE BiOS–Multiphoton Microscopy in the Biomedical Sciences XIV*, San Francisco, CA, Feb. 1-6, 2014.

70. R. Gilson, R. Tang, **P. Sarder**, and S. Achilefu, "Synthesis and study of novel targeted photosensitive for use in invasive breast cancer," *SPIE BiOS–Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXIII*, San Francisco, CA, Feb. 1-6, 2014.
71. **P. Sarder**, K. Gullicksrud, S. Mondal, G. Sudlow, S. Achilefu, and W. Akers, "Dynamic projection of fluorescence molecular imaging information for aiding oncologic surgery," *2013 World Molecular Imaging Congress*, Savannah, GA, Sep. 18-21, 2013.
72. **P. Sarder**, S. Yazdanfar, W. Akers, G. Sudlow, and S. Achilefu, "Comparison of near-infrared (NIR) confocal, existing multi-photon, and all-NIR multi-photon microscopy modalities in imaging deep tissues using cyanine dyes," *2013 World Molecular Imaging Congress*, Savannah, GA, Sep. 18-21, 2013.
73. X. Xu*, **P. Sarder***, Z. Li*, and A. Nehorai, "Optimization of microfluidic trap-based microsphere arrays," *SPIE–Microfluidics, BioMEMS, and Medical Microsystems XI*, San Francisco, CA, Feb. 2013. [*XX, PS, and ZL contributed equally.]
74. **P. Sarder**, N. Segata, D. Gevers, J. Izard, and C. Huttenhower, "Functional understanding of microbial communities using experimental data integration," *2010 Human Microbiome Research Conference*, St. Louis, MO, Aug. 31 to Sep. 2, 2010.

Posters (select ones where I was the first author or presenting author)

1. "A user-friendly tool for cloud-based whole slide image segmentation, with examples from renal histopathology," in *the International Society for Magnetic Resonance in Medicine Workshop on Kidney MRI Biomarkers: The Route to Clinical Adoption*, Philadelphia, PA, Sep. 10, 2021. **UB**
2. "Prognostic glomerular morphometric phenotype discovery via clustering across large datasets," with Y. Chen, B. Ginley[†], A. Z. Rosenberg, A. Janowczyk, B. Lutnick[†], N. Lucarelli[†], C. E. Alpers, S. Jain, S. Grewenow, B. Steck, L. Barisoni, A. Madabhushi, and U. G. Balis, for the Kidney Precision Medicine Project, in *ASN Kidney Week 2021*, Online (due to COVID-19 pandemic), Nov. 4, 2021. **UB**
3. "Computational image analysis of renal pathology biopsies," with B. Ginley[†], B. Lutnick[†], K. Y. Jen, S. Jain, and A. Rosenberg in *Kidney Precision Medicine Project (KPMP) Consortium Face-to-Face Meeting*, Washington, DC, Sep. 24, 2019. **UB**
4. "Computational analysis of cerebrovascular structures imaged using two-photon microscopy," with S. Dhiman[†] and I. Singh in *SPIE Medical Imaging–Digital Pathology*, San Diego, CA, Feb. 20, 2019. **UB**
5. "Towards computationally assisted evaluation in renal histology," with B. Ginley[†], B. Lutnick[†], D. Govind[†], R. Yacoub, K. Y. Jen, S. Jain, and J. E. Tomaszewski in *Renal Imaging Workshop - The National Institute of Diabetes and Digestive and Kidney Diseases 2018*, Bethesda, MD, Jul. 12, 2018. **UB**
6. "Estimating microscopic structures of glomeruli in renal pathology," with R. Yacoub and J. E. Tomaszewski in *Translational Science 2017*, Washington, DC, Apr. 19, 2017. **UB**
7. "Automatic quantification of glomerular structural features in renal pathology," with B. Ginley[†], B. Lutnick[†], R. Yacoub, R. Quigg, and J. Tomaszewski in *University at Buffalo Department of Medicine Research Day*, Buffalo, NY, Jun. 5, 2016. [Selected as "Poster of Distinction."] **UB**
8. "A novel approach for automated detection of neutrophil extracellular traps," with B. Ginley[†], T. Emmons, D. Govind[†], J. Tomaszewski, C. Urban, and B. Segal in *University at Buffalo Department of Medicine Research Day*, Buffalo, NY, Jun. 5, 2016. [Selected as "Poster of Distinction."] **UB**

9. "Community detection for fluorescent lifetime microscopy image segmentation," with D. Hu, P. Ronhovde, S. Orthaus, S. Achilefu, and Z. Nussinov in *Mallinckrodt Institute of Radiology Poster Session, Washington University School of Medicine in St. Louis, St. Louis, MO*, Mar. 25, 2014.
10. "Automatic segmentation of fluorescence lifetime microscopy images of cells using multi-resolution community detection," with D. Hu, P. Ronhovde, S. Orthaus, S. Achilefu, and Z. Nussinov in *SPIE BiOS-Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXI, San Francisco, CA*, Feb. 1-6, 2014.
11. "Comparison of near-infrared confocal and multiphoton microscopy modalities in deep tissue imaging using cyanine contrast agents," with S. Yazdanfar, W. Akers, G. Sudlow, C. Egbulefu, and S. Achilefu in *SPIE BiOS-Multiphoton Microscopy in the Biomedical Sciences XIV, San Francisco, CA*, Feb. 1-6, 2014.
12. "Comparison of near-infrared (NIR) confocal, existing multi-photon, and all-NIR multi-photon microscopy modalities in imaging deep tissues using cyanine dyes," with S. Yazdanfar, W. Akers, G. Sudlow, and S. Achilefu in *2013 World Molecular Imaging Congress, Savannah, GA*, Sep. 18-21, 2013.
13. "Comparison of NIR confocal, existing multiphoton, and all-NIR multiphoton microscopes in deep tissue imaging," with W. Akers, G. Sudlow, and S. Achilefu in *Mallinckrodt Institute of Radiology Poster Session, Washington University School of Medicine in St. Louis, St. Louis, MO*, Mar. 26, 2013.
14. "Fluorescence lifetime imaging microscopy using near-infrared contrast agents," with R. Nothdurft, S. Bloch, J. Culver, and S. Achilefu in *Mallinckrodt Institute of Radiology Poster Session, Washington University School of Medicine in St. Louis, St. Louis, MO*, Feb. 21, 2012.
15. "Functional understanding of microbial communities using experimental data integration," with N. Segata, D. Gevers, J. Izard, and C. Huttenhower in *2010 Human Microbiome Research Conference, St. Louis, MO*, Aug. 31 to Sep. 2, 2010.
16. "Complementary DNA microarray image segmentation," with A. Nehorai in *Imaging Sciences Retreat, Division of Biology and Biomedical Sciences, Washington University School of Medicine, St. Louis, MO*, Apr. 18, 2008.
17. "Performance analysis of quantifying fluorescence of target-captured microparticles from microscopy images," with A. Nehorai in *Fourth IEEE Workshop on Sensor Array and Multi-Channel Processing, Waltham, MA*, Jul. 14, 2006.

Select Software:

Human - A.I. - Loop In the Cloud:

Description: Ensemble of web plugins to analyze very large tissue histopathology images for quantifying tissue morphometric features.

Web: <https://athena.ccr.buffalo.edu>

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Artificial intelligence approaches may improve diagnostics of kidney disease

AAAS: <https://bit.ly/3eIhsoo>

Economic Times: <https://bit.ly/32EcG5T>