

Washington University in St. Louis
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Education

- 2011-2015 **École polytechnique fédérale de Lausanne (EPFL)**, Lausanne, Switzerland
Ph.D. in Electrical Engineering
Thesis: “Sparsity-driven Statistical Inference for Inverse Problems”
Advisor: Prof. Michael Unser
- 2008-2011 **EPFL**, Lausanne, Switzerland
M.Sc. in Communication Systems
Thesis: “Optimal Quantization for Compressive Sensing with Relaxed Belief Propagation”
Advisors: Prof. Vivek Goyal (MIT) and Prof. Martin Vetterli (EPFL)
- 2005-2008 **EPFL**, Lausanne, Switzerland
B.Sc. in Communication Systems
- 2007-2008 **Carnegie Mellon University**, Pittsburgh, PA, USA
Exchange Student in Electrical and Computer Engineering (ECE)

Research and professional experience

- 2017-present **Washington University in St. Louis (WUSTL)**, St. Louis, MO, USA
Assistant Professor of Computer Science and Engineering (CSE)
Assistant Professor of Electrical and Systems Engineering (ESE)
• Group leader of Computational Imaging Group (CIG).
- 2015-2017 **Mitsubishi Electric Research Laboratories (MERL)**, Cambridge, MA, USA
Research Scientist in Computational Sensing.
• Computational sensing and imaging. Multimodal imaging.
- 2011-2015 **EPFL**, Lausanne, Switzerland
Research Assistant in the Biomedical Imaging Group (BIG)
• Learning Tomography. Compressive imaging methods.
- 2013 **Stanford University**, Stanford, CA, USA
Visiting Student Researcher in the Information Systems Lab (ISL)
• Statistical inference with Belief Propagation.
- 2010-2011 **Massachusetts Institute of Technology (MIT)**, Cambridge, MA, USA
Visiting Student in the Research Lab of Electronics (RLE)
• Message-passing algorithms for Compressive Sensing. Single-pixel imaging.
- 2009 **Microsoft Corporation**, Zurich, Switzerland
Intern
• Software development for distributed communication systems.

Honors and awards

- 2017 IEEE Signal Processing Society Best Paper Award
- 2016 EPFL Doctorate Award finalist
- 2015 Featured in Nature “News & Views” (Nature, Vol. 523, Iss. 7561, p. 416, 2015)
- 2013 Member of team that received Education Award from Life Sciences Department of EPFL

Research interests and expertise

Current research focus: My research focuses on the advancement of computational imaging. Specifically, my goal is to leverage the advances in optimization, machine learning, and statistical inference to design new models, algorithms, and systems for imaging. My work is inherently interdisciplinary and has broad applications in biomedical imaging, defense, physical science, and industrial inspection. I extensively collaborate with researchers in optics, medicine, biology, as well as with those working in industry.

Areas of expertise: Signal and image processing. Sparse regularization and compressive sensing. Traditional and convolutional sparse representations. Tomographic imaging. Multimodal imaging. Inverse problems. Statistical inference. Large-scale optimization algorithms. Belief propagation and message passing.

Publications

Journal

1. H.-Y. Liu, D. Liu, H. Mansour, P. T. Boufounos, L. Waller, and U. S. Kamilov, "SEAGLE: Sparsity-Driven Image Reconstruction under Multiple Scattering," *IEEE Trans. Comput. Imag.*, vol. 4, no. 1, pp. 73-86, March 2018.
2. U. S. Kamilov, H. Mansour, and B. Wohlberg, "A Plug-and-Play Priors Approach for Solving Nonlinear Imaging Inverse Problems," *IEEE Signal Process. Letters*, vol. 24, no. 12, pp. 1872-1876, December 2017.
3. U. S. Kamilov and P. T. Boufounos, "Motion-Adaptive Depth Superresolution," *IEEE Trans. Image Process.*, vol. 26, no. 4, pp. 1723-1731, April 2017.
4. U. S. Kamilov, "A Parallel Proximal Algorithm for Anisotropic Total Variation Minimization," *IEEE Trans. Image Process.*, vol. 26, no. 2, pp. 539-548, February 2017.
5. S. Rangan, A. K. Fletcher, P. Schniter, and U. S. Kamilov, "Inference for Generalized Linear Models via Alternating Directions and Bethe Free Energy Minimization," *IEEE Trans. Inf. Theory*, vol. 63, no. 1, pp. 676-697, January 2017.
6. U. S. Kamilov, D. Liu, H. Mansour, and P. T. Boufounos, "A Recursive Born Approach to Nonlinear Inverse Scattering," *IEEE Signal Process. Letters*, vol. 23, no. 8, pp. 1052-1056, August 2016.
7. U. S. Kamilov and H. Mansour, "Learning optimal nonlinearities for iterative thresholding algorithms," *IEEE Signal Process. Letters*, vol. 23, no. 5, pp. 747-751, May 2016.
8. U. S. Kamilov, I. N. Papadopoulos, M. H. Shoreh, A. Goy, C. Vonesch, M. Unser, and D. Psaltis, "Optical tomographic image reconstruction based on beam propagation and sparse regularization," *IEEE Trans. Comput. Imag.*, vol. 2, no. 1, pp. 59-70, March 2016.
9. U. S. Kamilov, I. N. Papadopoulos, M. H. Shoreh, A. Goy, C. Vonesch, M. Unser, and D. Psaltis, "Learning Approach to Optical Tomography," *Optica*, vol. 2, no. 6, pp. 517-522, June 2015.
★ Covered by Nature "News & Views" article "Computational imaging: Machine learning for 3D microscopy" in July 2015 (Nature, Vol. 523, Iss. 7561, p. 416, 2015).
10. U. S. Kamilov, I. N. Papadopoulos, M. H. Shoreh, D. Psaltis, and M. Unser, "Isotropic inverse-problem approach for two-dimensional phase unwrapping," *J. Opt. Soc. Am. A*, vol. 32, no. 6, pp. 1092-1100, June 2015.
11. U. S. Kamilov, E. Bostan, and M. Unser, "Variational Justification of Cycle Spinning for Wavelet-Based Solutions of Inverse Problems," *IEEE Signal Process. Letters*, vol. 21, no. 11, pp. 1326-1330, November 2014
12. U. S. Kamilov, S. Rangan, A. K. Fletcher, and M. Unser, "Approximate Message Passing with Consistent Parameter Estimation and Application to Sparse Learning," *IEEE Trans. Inf. Theory*, vol. 60, no. 5, pp. 2969-2985, May 2014.
13. E. Bostan, U. S. Kamilov, M. Nilchian, and M. Unser, "Sparse Stochastic Processes and Discretization of Linear Inverse Problems," *IEEE Trans. Image Process.*, vol. 22, no. 7, pp. 2699-2710, July 2013.

Publications (cont.)

14. A. Kazerouni, U. S. Kamilov, E. Bostan, and M. Unser, “Bayesian Denoising: From MAP to MMSE Using Consistent Cycle Spinning,” *IEEE Signal Process. Letters*, vol. 20, no. 3, pp. 249–252, March 2013.
15. A. Amini, U. S. Kamilov, E. Bostan, and M. Unser, “Bayesian Estimation for Continuous-Time Sparse Stochastic Processes,” *IEEE Trans. Signal Process.*, vol. 61, no. 4, pp. 907–920, February 2013.
16. U. S. Kamilov, P. Pad, A. Amini, and M. Unser, “MMSE Estimation of Sparse Lévy Processes,” *IEEE Trans. Signal Process.*, vol. 61, no. 10, pp. 137–147, January 2013.
17. U. S. Kamilov, V. K. Goyal, and S. Rangan, “Message-Passing De-Quantization with Applications to Compressed Sensing,” *IEEE Trans. Signal Process.*, vol. 60, no. 12, pp. 6270–6281, December 2012.
★ IEEE SPS Best Paper Award 2017.
18. U. S. Kamilov, A. Bourquard, A. Amini, and M. Unser, “One-Bit Measurements with Adaptive Thresholds,” *IEEE Signal Process. Letters*, vol. 19, no. 10., pp. 607–610, October 2012.
19. U. S. Kamilov, E. Bostan, and M. Unser, “Wavelet Shrinkage with Consistent Cycle Spinning Generalizes Total Variation Denoising,” *IEEE Signal Process. Letters*, vol. 19, no. 4, pp. 187–190, April 2012.

Conference, symposium, and workshop

1. H. Mansour, U. S. Kamilov, D. Liu, and P. T. Boufounos, “Radar Autofocus using Sparse Blind Deconvolution,” Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2018) (Calgary, Canada, March 15-20), in press.
2. B. Wen, U. S. Kamilov, D. Liu, H. Mansour, and P. T. Boufounos, “DeepCASD: An End-to-End Approach for Multi-spectral Image Super-Resolution,” Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2018) (Calgary, Canada, March 15-20), in press.
3. Y. Ma, H. Mansour, D. Liu, P. T. Boufounos, U. S. Kamilov, “Accelerated Image Reconstruction for Nonlinear Diffractive Imaging,” Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2018) (Calgary, Canada, March 15-20), in press.
4. K. Kojima, B. Wang, U. S. Kamilov, T. Koike-akino, and K. Parsons, “Acceleration of FDTD-based Inverse Design Using a Neural Network Approach,” Proc. OSA Advanced Photonics Congress 2017 (New Orleans, LA, USA, September 24-27), ITu1A.4.
5. K. Degraux, U. S. Kamilov, P. T. Boufounos, and D. Liu, “Online Convolutional Dictionary Learning for Multimodal Imaging,” Proc. IEEE Int. Conf. Image Proc. (ICIP 2017) (Beijing, China, September 17-20), pp. 1617-1621.
6. Y. Ma, D. Liu, H. Mansour, U. S. Kamilov, Y. Taguchi, P. T. Boufounos, and A. Vetro, “Fusion of multi-angular aerial Images based on epipolar geometry and matrix completion,” Proc. IEEE Int. Conf. Image Proc. (ICIP 2017) (Beijing, China, September 17-20), pp. 1197-1201.
7. M. H. Shoreh, A. Goy, J. Lim, U. S. Kamilov, M. Unser, and D. Psaltis, “Imaging cell clusters and tissue using learning tomography,” Proc. SPIE Optical Methods for Inspection, Characterization, and Imaging of Biomaterials III, 1033306, 26 June 2017.
8. H.-Y. Liu, D. Liu, H. Mansour, P. T. Boufounos, L. Waller, and U. S. Kamilov, “SEAGLE: Robust Computational Imaging under Multiple Scattering,” Proc. OSA Mathematics in Imaging (MATH 2017) (St. Francisco, CA, USA, June 26-29), MM4C.1.
9. U. S. Kamilov, H. Mansour, and D. Liu, “Learning Convolutional Proximal Filters,” Proc. 7th Workshop on Signal Process. with Adaptive Sparse Structured Representations (SPARS 2017) (Lisbon, Portugal, June 5-8).
10. H. Mansour, U. S. Kamilov, and O. Yilmaz, “A Kaczmarz Method for Low Rank Matrix Recovery,” Proc. 7th Workshop on Signal Process. with Adaptive Sparse Structured Representations (SPARS 2017) (Lisbon, Portugal, June 5-8).

Publications (cont.)

11. H.-Y. Liu, U. S. Kamilov, D. Liu, H. Mansour, and P. T. Boufounos, "Compressive Imaging with Iterative Forward Models," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2017) (New Orleans, USA, March 5-9), pp. 6025-6029.
★ ICASSP 2017 Student Paper Award finalist.
12. M. H. Shoreh, A. Goy, J. Lim, U. S. Kamilov, M. Unser, and D. Psaltis, "Optical Tomography based on a Nonlinear Model that Handles Multiple Scattering," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2017) (New Orleans, USA, March 5-9), pp. 6220-6224.
13. U. S. Kamilov and H. Mansour, "Learning Bayesian Optimal FISTA with Error Backpropagation," Proc. International Biomedical and Astronomical Signal Processing Frontiers Workshop (BASP 2017) (Villars-sur-Ollon, Switzerland, January 29-February 3), p. 66.
14. D. Liu, U. S. Kamilov, and P. T. Boufounos, "Compressive Tomographic Radar Imaging with Total Variation Regularization," Proc. IEEE 4th International Workshop on Compressed Sensing Theory and its Applications to Radar, Sonar, and Remote Sensing (CoSeRa 2016) (Aachen, Germany, September 19-22), pp. 120-123.
15. D. Liu, U. S. Kamilov, and P. T. Boufounos, "Coherent Distributed Array Imaging under Unknown Position Perturbations," Proc. IEEE 4th International Workshop on Compressed Sensing Theory and its Applications to Radar, Sonar, and Remote Sensing (CoSeRa 2016) (Aachen, Germany, September 19-22), pp. 105-109.
16. H. Mansour, U. S. Kamilov, D. Liu, P. Orlik, P. T. Boufounos, K. Parsons, and A. Vetro, "Online Blind Deconvolution for Sequential Through-the-Wall-Radar-Imaging," Proc. IEEE 4th International Workshop on Compressed Sensing Theory and its Applications to Radar, Sonar, and Remote Sensing (CoSeRa 2016) (Aachen, Germany, September 19-22), pp. 61-65.
17. U. S. Kamilov and H. Mansour, "Learning MMSE Optimal Thresholds for FISTA," Proc. 3rd International Traveling Workshop on Interactions between Sparse models and Technology (iTWIST 2016) (Aalborg, Denmark, August 24-26), p. 42.
18. U. S. Kamilov, "Minimizing Isotropic Total Variation without Subiterations," Proc. 3rd International Traveling Workshop on Interactions between Sparse models and Technology (iTWIST 2016) (Aalborg, Denmark, August 24-26), p. 39.
19. U. S. Kamilov, I. Papadopoulos, M. Hashemi, A. Goy, M. Unser, and D. Psaltis, "Learning From Examples in Optical Imaging," Proc. OSA Computational Optical Sensing and Imaging Conference (COSI 2016) (Heidelberg, Germany, July 25-28), CT1D.1.
20. U. S. Kamilov and P. T. Boufounos, "Depth Superresolution using Motion Adaptive Regularization," Proc. 2015 IEEE Int. Conf. Multimedia & Expo Workshops (ICMEW 2016) (Seattle, WA, USA, July 11-15), pp. 1-6.
21. U. S. Kamilov, "Parallel proximal methods for total variation minimization," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2016) (Shanghai, China, March 20-25), pp. 4697-4701.
22. J. Castorena, U. S. Kamilov, and P. T. Boufounos, "Autocalibration of Lidar and Optical Cameras via Edge Alignment," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2016) (Shanghai, China, March 20-25), pp. 2862-2866.
23. H. Mansour and U. S. Kamilov, "Multipath Removal by Online Blind Deconvolution in Through-the-Wall-Imaging," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2016) (Shanghai, China, March 20-25), pp. 3106-3110.
24. H. Handa, H. Mansour, D. Liu, and U. S. Kamilov, "Extended Target Localization with Total-Variation Denoising in Through-the-Wall-Imaging," Proc. 6th Int. Workshop on Computational Advances in Multi-Sensor Adaptive Process. (CAMSAP 2015) (Cancun, Mexico, December 13-16), pp. 445-448.

Publications (cont.)

25. D. Liu, U. S. Kamilov, and P. T. Boufounos, "Sparsity-Driven Distributed Array Imaging," Proc. 6th Int. Workshop on Computational Advances in Multi-Sensor Adaptive Process. (CAMSAP 2015) (Cancun, Mexico, December 13-16), pp. 441-444.
26. S. Rangan, A. K. Fletcher, P. Schniter, and U. S. Kamilov, "Inference for Generalized Linear Models via Alternating Directions and Bethe Free Energy Minimization," Proc. 2015 IEEE Int. Symp. Inform. Theory (ISIT 2015) (Hong Kong, June 14-19), pp. 1640-1644.
27. U. S. Kamilov, A. Bourquard, and M. Unser, "Sparse Image Deconvolution with Message Passing," Proc. 5th Workshop on Signal Process. with Adaptive Sparse Structured Representations (SPARS 2013) (Lausanne, Switzerland, July 8-11).
28. E. Bostan, U. S. Kamilov, M. Nilchian, and M. Unser, "Consistent Discretization of Linear Inverse Problems using Sparse Stochastic Processes," Proc. 5th Workshop on Signal Process. with Adaptive Sparse Structured Representations (SPARS 2013) (Lausanne, Switzerland, July 8-11).
29. E. Bostan, J. Fageot, U. S. Kamilov, and M. Unser, "MAP Estimators for Self-Similar Sparse Stochastic Models," Proc. 10th International Conference on Sampling Theory and Applications (SAMPTA 2013) (Bremen, Germany, July 1-5), pp. 197-199.
30. U. S. Kamilov, A. Bourquard, E. Bostan, and M. Unser, "Autocalibrated Signal Reconstruction from Linear Measurements using Adaptive GAMP," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2013) (Vancouver, Canada, May 26-31), pp. 5925-5928.
31. B. Tekin, U. S. Kamilov, E. Bostan, and M. Unser, "Benefits of Consistency in Image Denoising with Steerable Wavelets," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2013) (Vancouver, Canada, May 26-31), pp. 1355-1358.
32. U. S. Kamilov, S. Rangan, A. K. Fletcher, and M. Unser, "Approximate Message Passing with Consistent Parameter Estimation and Applications to Sparse Learning," Proc. 23rd Ann. Conf. Neural Information Processing Systems (NIPS 2012) (Lake Tahoe, Nevada, December 3-6), pp. 2447-2455.
★ Acceptance rate of $370/1467 = 25\%$.
33. A. Amini, U. S. Kamilov, and M. Unser, "The Analog Formulation of Sparsity Implies Infinite Divisibility and Rules Out Bernoulli-Gaussian Priors," Proc. IEEE Information Theory Workshop (ITW 2012) (Lausanne, Switzerland, September 3-7), pp. 687-691.
34. E. Bostan, U. S. Kamilov, and M. Unser, "Reconstruction of Biomedical Images and Sparse Stochastic Modelling," Proc. Int. Symp. Biomedical Imaging (ISBI 2012) (Barcelona, Spain, May 2-5), pp. 880-883.
35. U. S. Kamilov, A. Amini, and M. Unser, "MMSE Denoising of Sparse Lévy Processes via Message Passing," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2012) (Kyoto, Japan, March 25-30), pp. 3637-3640.
36. U. S. Kamilov, E. Bostan, and M. Unser, "Generalized Total Variation Denoising via Augmented Lagrangian Cycle Spinning with Haar Wavelets," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2012) (Kyoto, Japan, March 25-30), pp. 909-912.
37. A. Amini, U. S. Kamilov, and M. Unser, "Bayesian Denoising of Stochastic Processes with Finite Rate of Innovation," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2012) (Kyoto, Japan, March 25-30), pp. 3629-3632.
38. U. S. Kamilov, V. K. Goyal, and S. Rangan, "Generalized Approximate Message Passing Estimation from Quantized Samples," Proc. 4th Int. Workshop on Computational Advances in Multi-Sensor Adaptive Process. (CAMSAP 2011) (San Juan, Puerto Rico, December 13-16), pp. 401-404.
★ CAMSAP 2011 Student Paper Award finalist.

Publications (cont.)

39. U. S. Kamilov, V. K. Goyal, and S. Rangan, "Optimal Quantization for Compressive Sensing under Message Passing Reconstruction," Proc. 2011 IEEE Int. Symp. Inform. Theory (ISIT 2011) (Saint-Petersburg, Russia, July 31–August 5), pp. 390–394.

Thesis

1. U. S. Kamilov, "Sparsity-Driven Statistical Inference for Inverse Problems," Swiss Federal Institute of Technology Lausanne, EPFL Thesis no. 6545 (2015), 198 p., March 27, 2015.
2. U. S. Kamilov, "Optimal Quantization for Compressive Sensing with Relaxed Belief Propagation," Master's Thesis EPFL/MIT, April 2011.

Patents

1. "System and Method for Determining Structure of Material," with D. Liu, H. Mansour, and P. T. Boufounos, March 2016.
2. "System and Method for Fusing Outputs of Sensors Having Different Resolutions," with P. T. Boufounos and J. Castorena, January 2016.
3. "Method and System for Motion Adaptive Fusion of Optical Images and Depth Maps Acquired by Cameras and Depth Sensors," with P. T. Boufounos, December 2015.
4. "Method and System for Through-the-Wall Radar Imaging," with H. Mansour, July 2015.
5. "System and Method for Through-the-Wall-Radar-Imaging using Total-Variation Denoising," with H. Handa, H. Mansour, and D. Liu, July 2015.
6. "System and Method for Radar Imaging Using Distributed Arrays and Compressive Sensing," with D. Liu and P. T. Boufounos, July 2015.

Selected talks

1. NC State University, Raleigh, NC, USA, Distinguished Seminar Series, 03/2018 (invited)
 - "Regularized Image Reconstruction for Nonlinear Diffractive Imaging"
2. Washington University Imaging Science Seminar, St. Louis, MO, USA, 10/2017
 - "CISOR: Convergent Inverse Scattering using Optimization and Regularization"
3. WIPS-LEARN workshop, Louvain-la-Neuve, Belgium, 08/2017 (plenary)
 - "CISOR: Convergent Inverse Scattering using Optimization and Regularization"
4. OSA Imaging and Applied Optics Congress 2017, St. Francisco, CA, USA, 06/2017 (invited)
 - "Robust Computational Imaging under Multiple Scattering"
5. Boston University, Boston, MA, CSE Colloquia, 04/2017 (invited)
 - "Robust Computational Imaging under Multiple Scattering"
6. Washington University, St. Louis, MO, CSE Colloquia, 04/2017 (invited)
 - "Robust Computational Imaging under Multiple Scattering"
7. Harvard University, Cambridge, MA, SEAS ISS Seminar, 04/2017 (invited)
 - "Robust Computational Imaging under Multiple Scattering"
8. Imperial College, London, UK, Seminar, 04/2017 (invited)
 - "Robust Computational Imaging under Multiple Scattering"

Selected talks (cont.)

10. BASP 2017, Villars-sur-Ollon, Switzerland, 01/2017. (invited)
 - “Learning Bayesian Optimal FISTA with Error Backpropagation”
11. IEEE CoSeRa 2016, Aachen, Germany, 09/2016.
 - “Online Blind Deconvolution for Sequential Through-the-Wall-Radar-Imaging”
 - “Coherent Distributed Array Imaging under Unknown Position Perturbations”
 - “Compressive Tomographic Radar Imaging with Total Variation Regularization”
12. iTWIST 2016, Aalborg, Denmark, 08/2016.
 - “Learning MMSE Optimal Thresholds for FISTA”
 - “Minimizing Isotropic Total Variation without Subiterations”
13. NYU Tandon School of Engineering, Brooklyn, NY, Seminar, 06/2016. (invited)
 - “Trainable Iterative Algorithms for Computational Sensing”
14. Tufts University, Medford, MA, ECE Colloquia, 04/2016. (invited)
 - “Compressive Imaging with Learning Optical Tomography”
15. Jiao Tong University, Shanghai, China, Institute of Natural Sciences, 03/2016. (invited)
 - “Compressive Imaging with Learning Optical Tomography”
16. Harvard University, Cambridge, MA, ISS Seminar, 04/2015. (invited)
 - “Inverse problem approach for phase unwrapping”
17. IEEE ICASSP 2015, Brisbane, Australia, 04/2015.
 - “Variational justification of Cycle Spinning for Wavelet-Based Solutions of Inverse Problems”
18. IEEE ITW 2012, Lausanne, Switzerland, 09/2012.
 - “Analog Formulation of Sparsity Rules Out Bernoulli-Gaussian Priors”
19. NYU-Polytechnic Institute, Brooklyn, NY, 04/2012. (invited)
 - “Analog Perspective on Sparsity: Optimal Estimation of Sparse Lévy Processes”
20. IEEE ICASSP 2012, Kyoto, Japan, 03/2012.
 - “Generalized Total Variation Denoising via Augmented Lagrangian Cycle Spinning”
 - “MMSE Denoising of Sparse Lévy Processes via Message Passing”
21. IEEE CAMSAP 2011, San Juan, Puerto Rico, 12/2011.
 - “Generalized Approximate Message Passing Estimation from Quantized Samples”
22. IEEE ISIT 2011, Saint-Petersburg, Russia, 08/2011.
 - “Optimal Quantization for Compressive Sensing under Message Passing Reconstruction”

Teaching and educational contributions

1. Optimization (Lecturer, WUSTL, ESE 415, Spring 2017)

Topics: Unconstrained and constrained optimization; convex optimization; computational optimization methods; optimality conditions; duality theory; gradient and accelerated gradient methods; Newton’s method; conjugate gradient method; projected gradient method; penalty and barrier methods.

2. Sparse Modeling for Imaging and Vision (Lecturer, WUSTL, CSE 585T, Fall 2017)

Topics: Underdetermined systems and sparsity; recovery guarantees and compressive sensing; large-scale algorithms: matching pursuits, proximal-gradient algorithms, and variable splitting methods; image denoising, restoration, and reconstruction; matrix factorization, dictionary learning, and robust principal component analysis; sparse models for visual recognition.

Teaching and educational contributions (cont.)

Teaching assistant at EPFL

1. Signals and Systems I: Autumn 2011, Autumn 2012, Autumn 2013
★ Education Award 2013 from Life Sciences Department of EPFL.
2. Signals and Systems II: Spring 2012, Spring 2013, Spring 2014
3. Introduction to Object Oriented Programming: Autumn 2008
4. Introduction to Communication Systems: Autumn 2007

Student supervision

Current PhD students

1. Yu Sun (WUSTL, Computer Science and Engineering, 2018-present)
2. Xiaojian Xu (WUSTL, Computer Science and Engineering, 2018-present)

Students supervised at WUSTL

1. Shiqi Xu (MSc in Electrical Engineering, Spring 2018)
2. Hanyu Feng (MSc in Electrical Engineering, Spring 2018)
3. Terry Pan (MSc in Electrical Engineering, Spring 2018)
4. Wenmei Bo (MSc in Electrical Engineering, Spring 2018)

Thesis committees

1. He Huang, “Novel Sensing Mechanisms for Chemical and Bio-sensing Using Whispering Gallery Mode Microresonators,” Ph.D., Electrical and Systems Engineering, WUSTL, St. Louis, MO, USA, January 2018
2. Homayoon Ranjbar, “Reconstruction Algorithms for Novel Joint Imaging Techniques in PET,” Ph.D., Electrical and Systems Engineering, WUSTL, St. Louis, MO, USA, December 2017
3. Kevin Degraux, “Methods for Solving Regularized Inverse Problems: From Non-Euclidean Fidelities to Computational imaging Applications,” Ph.D., Engineering Sciences, Université catholique de Louvain (UCL), Louvain-la-Neuve, Belgium, September 2017

Interns supervised at MERL

1. Yanting Ma (North Carolina State University, 2017)
2. Bihan Wen (with Dehong Liu, UIUC, 2017)
3. Kevin Degraux (Université Catholique de Louvain, 2016)
4. Hsiou-Yuan Liu (UC Berkeley, 2016)
5. Juan Castorena (New Mexico State University, 2015)

Students supervised at EPFL (co-supervised with Prof. Michael Unser)

1. Sander Kromwijk (student at EPFL, 2014)
2. Mamoun Benkirane (student at EPFL, 2014)
3. Julien Schwab (student at EPFL, 2013)
4. Abbas Kazerouni (intern from Sharif University, 2012)
5. Ipek Baz (student at EPFL, 2012)
6. Bugra Tekin (student at EPFL, 2012)
7. Pedram Pad (intern from Sharif Univ., 2011)

Professional activities and service

Professional societies

- Institute of Electrical and Electronics Engineers (IEEE)
Student Member (2011–2015)
Member (2015–present)
- Optical Society of America (OSA)
Member (2017–present)
- Sigma Xi
Member (2014–present)

Professional activities and service (cont.)

Associate editor

- SPIE Journal of Electronic Imaging (2017-present)

Technical committees

- IEEE Special Interest Group (SIG) in Computational Imaging Member (2016–present)

Special session organization at conferences:

- “Large-Scale Computational Imaging with Wave Models,” with Prof. Laura Waller and Dr. Brendt Wohlberg at IEEE ICASSP 2017.

Reviewer for journals

- OSA Optica
- IEEE Transactions on Computational Imaging
- IEEE Transactions on Image Processing
- IEEE Transactions on Signal Processing
- OSA Journal of the Optical Society of America A
- IEEE Signal Processing Letters
- IEEE Transactions on Medical Imaging
- Elsevier Signal Processing
- IEEE Journal of Biomedical and Health Informatics
- IEEE Journal of Selected Topics in Signal Processing
- SIAM Journal of Imaging Science
- OSA Optics Express
- OSA Optics Letters

Reviewer for conferences

- OSA MATH 2018 (prog. committee)
- IEEE CVPR CCD 2018
- IEEE ICASSP 2017 (area chair)
- IEEE ICIP 2017
- ICCP 2017
- IEEE ISIT 2015, 2017
- IEEE ICME 2016
- NIPS 2014, 2015
- IEEE CAMSAP 2015
- IEEE ITW 2014
- IEEE ICASSP 2012
- IEEE ISBI 2012

Other experiences

- Student representative for Communication Systems Department at EPFL for 2008–2011.
- Founded an educational consultancy company “G.e.P. Solutions” in 2010–2013.
- Committee member of Erasmus Student Network chapter of EPFL in 2009.
- Member of the coaching team for new undergraduate students at EPFL in 2009.

Language skills

- English, French, German, Russian, and Uzbek.

Biography

Ulugbek S. Kamilov is an Assistant Professor and Group Leader of Computational Imaging Group (CIG) at Washington University in St. Louis. His main research area is computational imaging with an emphasis on the development of computational methods for biomedical and industrial applications. He has a strong interest in image reconstruction, compressive imaging, convex and nonconvex optimization, machine learning, and statistical inference. He has co-authored over 19 journal and 39 conference publications in these areas.

Prof. Kamilov was born in Tashkent, Uzbekistan. He received his M.Sc. in Communication Systems and Ph.D. in Electrical Engineering, in 2011 and 2015, respectively, from the École polytechnique fédérale de Lausanne (EPFL), Switzerland. In 2007, he was an Exchange Student at Carnegie Mellon University (CMU), Pittsburgh, PA, USA, in 2010, a Visiting Student at Massachusetts Institute of Technology (MIT), Cambridge, MA, USA, and in 2013, a Visiting Student Researcher at Stanford University, Stanford, CA, USA. From 2015 to 2017, he was a Research Scientist at Mitsubishi Electric Research Laboratories (MERL), Cambridge, MA, USA.

Prof. Kamilov is recipient of the IEEE Signal Processing Society's 2017 Best Paper Award (with V. Goyal and S. Rangan). His Ph.D. thesis was selected as a finalist for the EPFL Doctorate Award in 2016. His work on Learning Tomography (LT) was featured in Nature “News and Views” in 2015.

Biography (cont.)

Prof. Kamilov is serving as an Associate Editor for the SPIE Journal of Electronic Imaging (2017-present). He is a member of IEEE Special Interest Group on Computational Imaging (2016-present). He served as Computational Imaging area chair for IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2017) in New Orleans, LA, USA. He served as a program committee member for OSA Mathematics in Imaging 2018. He has also co-organized a special session on “Large-Scale Computational Imaging with Wave Models” at ICASSP 2017. He is a member of IEEE and OSA.