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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
- 2011-2015      **EPFL**, Lausanne, Switzerland  
Research Assistant in the Biomedical Imaging Group (BIG)  
• Learning tomography. Statistical image modeling
- 2013              **Stanford University**, Stanford, CA, USA  
Visiting Student Researcher in the Information Systems Lab (ISL)  
• Bayesian inference using message-passing algorithms
- 2010-2011      **Massachusetts Institute of Technology (MIT)**, Cambridge, MA, USA  
Visiting Student in the Research Lab of Electronics (RLE)  
• Message-passing algorithms. Single-pixel imaging
- 2009              **Microsoft Corporation**, Zurich, Switzerland  
Software Engineering Intern  
• Software development for distributed VoIP communication

## 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 goal is to make imaging systems more intelligent by rethinking imaging pipelines from the modern computational perspective. I seek to advance computational imaging by focusing on its foundational aspects related to large-scale data processing and machine learning. This makes my work inherently interdisciplinary with applications to medicine, biology, defense, and physical sciences.

## Publications

### Preprints

1. G. Song, Y. Sun, J. Liu, and U. S. Kamilov, "A New Recurrent Plug-and-Play Prior Based on the Multiple Self-Similarity Network," *arXiv:1907.11793*.

### Journal

1. Y. Sun, B. Wohlberg, and U. S. Kamilov, "An Online Plug-and-Play Algorithm for Regularized Image Reconstruction," *IEEE Trans. Comput. Imaging*, vol. 5, no. 3, pp. 395-408, September 2019.
2. W. Tahir, U. S. Kamilov, and L. Tian, "Holographic Particle Localization under Multiple Scattering," *SPIE Adv. Photon.*, vol. 1, no. 3, p. 036003, May/June 2019.
3. H. Mansour, D. Liu, U. S. Kamilov, and P. T. Boufounos, "Sparse Blind Deconvolution for Distributed Radar Autofocus Imaging," *IEEE Trans. Comput. Imaging*, vol. 4, no. 4, pp. 537-551, December 2018.
4. E. Bostan, U. S. Kamilov, and L. Waller, "Learning-based Image Reconstruction via Parallel Proximal Algorithm," *IEEE Signal Process. Lett.*, vol. 25, no. 7, pp. 989-993, July 2018.
5. Y. Sun, Z. Xia, and U. S. Kamilov, "Efficient and accurate inversion of multiple scattering with deep learning," *Opt. Express*, vol. 26, no. 11, pp. 14678-14688, May 2018.
6. 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.
7. U. S. Kamilov, H. Mansour, and B. Wohlberg, "A Plug-and-Play Priors Approach for Solving Nonlinear Imaging Inverse Problems," *IEEE Signal Process. Lett.*, vol. 24, no. 12, pp. 1872-1876, December 2017.
8. U. S. Kamilov and P. T. Boufounos, "Motion-Adaptive Depth Superresolution," *IEEE Trans. Image Process.*, vol. 26, no. 4, pp. 1723-1731, April 2017.
9. 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.
10. 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.
11. U. S. Kamilov, D. Liu, H. Mansour, and P. T. Boufounos, "A Recursive Born Approach to Nonlinear Inverse Scattering," *IEEE Signal Process. Lett.*, vol. 23, no. 8, pp. 1052-1056, August 2016.
12. U. S. Kamilov and H. Mansour, "Learning optimal nonlinearities for iterative thresholding algorithms," *IEEE Signal Process. Lett.*, vol. 23, no. 5, pp. 747-751, May 2016.
13. 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.
14. 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).

## Publications (cont)

15. 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.
16. U. S. Kamilov, E. Bostan, and M. Unser, "Variational Justification of Cycle Spinning for Wavelet-Based Solutions of Inverse Problems," *IEEE Signal Process. Lett.*, vol. 21, no. 11, pp. 1326–1330, November 2014
17. 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.
18. 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.
19. A. Kazerouni, U. S. Kamilov, E. Bostan, and M. Unser, "Bayesian Denoising: From MAP to MMSE Using Consistent Cycle Spinning," *IEEE Signal Process. Lett.*, vol. 20, no. 3, pp. 249–252, March 2013.
20. 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.
21. 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.
22. 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.
23. U. S. Kamilov, A. Bourquard, A. Amini, and M. Unser, "One-Bit Measurements with Adaptive Thresholds," *IEEE Signal Process. Lett.*, vol. 19, no. 10., pp. 607–610, October 2012.
24. U. S. Kamilov, E. Bostan, and M. Unser, "Wavelet Shrinkage with Consistent Cycle Spinning Generalizes Total Variation Denoising," *IEEE Signal Process. Lett.*, vol. 19, no. 4, pp. 187–190, April 2012.

### Conference, symposium, and workshop

1. Y. Sun, J. Liu, and U. S. Kamilov, "Block Coordinate Regularization by Denoising," Proc. 32nd Ann. Conf. Neural Information Processing Systems (NeurIPS 2019) (Vancouver, Canada, December 8-14).  
★ Acceptance rate of  $1428/6743 = 21\%$ .
2. Z. Wu, Y. Sun, J. Liu, and U. S. Kamilov, "Online Regularization by Denoising with Applications to Phase Retrieval," Proc. IEEE Int. Conf. Comp. Vis. Workshops (ICCVW 2019) (Seoul, South Korea, Oct 27-Nov 2).
3. J. Xing, U. S. Kamilov, W. Wu, Y. Wang, and M. Zhang, "Plug-and-Play Priors for Reconstruction-based Placental Image Registration," Proc. Medical Image Computing and Computer-Assisted Intervention Workshops (MICCAIW) (Shenzhen, China, Oct 13-17), pp. 133–142.
4. J. Liu, Y. Sun, X. Xu, and U. S. Kamilov, "Image Restoration using Total Variation Regularized Deep Image Prior," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2019) (Brighton, UK, May 12-17), pp. 7715–7719.
5. Y. Sun, S. Xu, Y. Li, L. Tian, B. Wohlberg, and U. S. Kamilov, "Regularized Fourier Ptychography using an Online Plug-and-Play Algorithm," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2019) (Brighton, UK, May 12-17), pp. 7665–7669.
6. X. Xu and U. S. Kamilov, "signProx: One-Bit Proximal Algorithm for Nonconvex Stochastic Optimization," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2019) (Brighton, UK, May 12-17), pp. 7800–7804.

## Publications (cont)

7. Y. Sun, B. Wohlberg, and U. S. Kamilov, "Plug-In Stochastic Gradient Method," Proc. International Biomedical and Astronomical Signal Processing Frontiers Workshop (BASP 2019) (Villars-sur-Ollon, Switzerland, February 3-8), p. 75.
8. Y. Sun and U. S. Kamilov, "Stability of Scattering Decoder For Nonlinear Diffractive Imaging," Proc. 4th International Traveling Workshop on Interactions between Sparse models and Technology (iTWIST 2018) (Marseille, France, November 21-23), p. 31.
9. D. Liu, H. Mansour, P. T. Boufounos, and U. S. Kamilov "Robust sensor localization based on Euclidean distance matrix," Proc. Int. Geosci. Remote Sensing Symp. (IGARSS 2018) (Valencia, Spain, July 23-27), pp. 7998-8001.
10. Y. Ma, H. Mansour, D. Liu, P. T. Boufounos, and U. S. Kamilov "Nonconvex optimization for diffractive imaging," Proc. OSA Mathematics in Imaging (MATH 2018) (Orlando, FL, USA, June 25-28), MW5D.3.
11. W. Tahir, U. S. Kamilov, and L. Tian "Sampling and processing for multiple scattering in inline compressive holography," Proc. OSA Mathematics in Imaging (MATH 2018) (Orlando, FL, USA, June 25-28), JTh3B.1.
12. 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), pp. 1623-1627.
13. 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), pp. 6503-6507.
14. 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), pp. 6473-6477.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.
20. 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), p. 101.
21. 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), p. 60.

## Publications (cont)

22. 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.
23. 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.
24. 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.
25. 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.
26. 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.
27. 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.
28. 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.
29. 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.
30. 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.
31. 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.
32. 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.
33. 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.
34. 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.
35. 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)

36. 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.
37. 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.
38. 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).
39. 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).
40. 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.
41. 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.
42. 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.
43. 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  $370/1467 = 25\%$ .
44. 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.
45. 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.
46. 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.
47. 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.
48. 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.
49. 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.
50. U. S. Kamilov, V. K. Goyal, and S. Rangan, "Message-Passing Estimation from Quantized Samples," Proc. 4th Workshop on Signal Process. with Adaptive Sparse Structured Representations (SPARS 2011) (Edinburgh, United Kingdom, June 27-June 30), p. 58.

## Publications (cont)

51. 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.  
★ EPFL Doctorate Award finalist.
2. U. S. Kamilov, "Optimal Quantization for Compressive Sensing with Relaxed Belief Propagation," Master's Thesis EPFL/MIT, April 2011.

## Patents

1. "Systems and Methods for Multi-Spectral Image Super-Resolution," with D. Liu, B. Wen, H. Mansour, and P. T. Boufounos, 11/2019 (US Patent 10,482,576)
2. "Online convolutional dictionary learning," with K. Degraux, P. T. Boufounos, and D. Liu, 09/2019 (US Patent 10,409,888)
3. "Systems and Methods of Fusing Multi-angle View HD Images Based on Epipolar Geometry and Matrix Completion," with D. Liu, Y. Ma, H. Mansour, Y. Taguchi, P. T. Boufounos, and A. Vetro, 02/2019 (US Patent 10,212,410)
4. "Method and System for Motion Adaptive Fusion of Optical Images and Depth Maps Acquired by Cameras and Depth Sensors," with P. T. Boufounos, 12/2018 (US Patent 10,148,873)
5. "System and Method for Radar Imaging Using Distributed Arrays and Compressive Sensing," with D. Liu and P. T. Boufounos, 08/2018 (US Patent 10,042,046)
6. "System and Method for Through-the-Wall-Radar-Imaging using Total-Variation Denoising," with H. Handa, H. Mansour, and D. Liu, 05/2018 (US Patent 9,971,019)
7. "Method and System for Through-the-Wall Radar Imaging," with H. Mansour, 03/2018 (US Patent 9,915,730)

## Funding

NSF 1852343	Co-I	\$379,994	04/2019-03/2022	REU Site: Big Data Analytics
Siemens	Co-PI	\$153,001	09/2018-08/2021	Deep Learning for Motion-Robust 4D MRI
NSF 1813910	PI	\$265,293	07/2018–06/2021	Signal Processing for Nonlinear Diffractive Imaging: Acquisition, Reconstruction, and Applications
WUSTL CIG	Co-PI	\$25,000	06/2018–05/2019	Data-Adaptive Imaging for Motion-Robust High-Resolution Dynamic MRI

## Invited talks

1. Washington University, St. Louis, MO, USA, Imaging Science Seminar, 11/2019
2. Argonne National Laboratory, Lemont, IL, USA, 11/2019
3. Washington University, St. Louis, MO, USA, Applications of AI in Radiology, 11/2019

## Invited talks (cont)

4. ICCV 2019, Seoul, South Korea, Learning for Computational Imaging Workshop, 10/2019
5. Institut d'Etudes Scientifiques, Cargèse, France, School on Imaging in Wave Physics, 09/2019
6. Los Alamos National Laboratory, Los Alamos, NM, USA, 08/2019
7. Oak Ridge National Laboratory, Oak Ridge, TN, USA, AI Summer Institute Seminar, 08/2019
8. Brown University, Providence, RI, USA, ICERM Workshop on Computational Imaging, 03/2019
9. University of Iowa, Iowa City, IA, USA, ECE seminar, 11/2018
10. iTWIST 2018, Marseille, France, 11/2018 (plenary)
11. Washington University, St. Louis, MO, USA, Imaging Science Seminar, 09/2018
12. SIAM Imaging Sciences Workshop 2018, Bologna, Italy, 06/2018
13. NC State University, Raleigh, NC, USA, Distinguished Seminar Series, 03/2018
14. Washington University Imaging Science Seminar, St. Louis, MO, USA, 10/2017
15. WIPS-LEARN workshop, Louvain-la-Neuve, Belgium, 08/2017 (plenary)
16. OSA Imaging and Applied Optics Congress 2017, St. Francisco, CA, USA, 06/2017
17. Boston University, Boston, MA, CSE Colloquia, 04/2017
18. Washington University, St. Louis, MO, CSE Colloquia, 04/2017
19. Harvard University, Cambridge, MA, SEAS ISS Seminar, 04/2017
20. Imperial College, London, UK, Seminar, 04/2017
21. BASP 2017, Villars-sur-Ollon, Switzerland, 01/2017
22. NYU Tandon School of Engineering, Brooklyn, NY, Seminar, 06/2016
23. Tufts University, Medford, MA, ECE Colloquia, 04/2016
24. Jiao Tong University, Shanghai, China, Institute of Natural Sciences, 03/2016
25. Harvard University, Cambridge, MA, ISS Seminar, 04/2015
26. NYU-Polytechnic Institute, Brooklyn, NY, 04/2012

## Teaching and educational contributions

1. Optimization (Instructor, WUSTL, ESE 415)  
Spring 2018-Spring 2020  
Lecture notes for Spring 2019 are openly available online: [cigroup.wustl.edu/teaching/ese415-2019](http://cigroup.wustl.edu/teaching/ese415-2019).

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.



## Teaching and educational contributions (cont)

2. Sparse Modeling for Imaging and Vision (Instructor, WUSTL, CSE 585T/ESE 585A)  
Fall 2017-Fall 2018

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.

3. Teaching assistant at EPFL (2007-2013)
  - a. Signals and Systems I: Autumn 2011, Autumn 2012, Autumn 2013  
★ Education Award 2013 from Life Sciences Department of EPFL.
  - b. Signals and Systems II: Spring 2012, Spring 2013, Spring 2014
  - c. Introduction to Object Oriented Programming: Autumn 2008
  - d. Introduction to Communication Systems: Autumn 2007

## Student supervision

### Current PhD students

1. Xiaojian Xu (WUSTL, CSE, 2017-present)
2. Yu Sun (WUSTL, CSE, 2018-present)
3. Jiaming Liu (WUSTL, ESE, 2019-present)

### Visiting PhD students supervised at WUSTL

1. Guangxiao Song (Donghua University, China, 2018-present)

### Masters students supervised at WUSTL

1. Weijie Gan (MS, ESE, 2018-2019)
2. Jiaming Liu (MS, ESE, 2018-2019)
3. Shu Pan (MS, ESE, 2019)
4. Yiran Sun (MS, ESE, 2019)
5. Ryogo Suzuki (MS, Robotics, 2019)
6. Max Torop (MS, CSE, 2019)
7. Shiqi Xu (MS, ESE, 2018-2019)
8. Melena Abijaoude (MS, ESE, 2018)
9. Fa Long (MS, ESE, 2018)
10. Jerry Xing (MS, CSE, 2018)
11. Fangying Zhai (MS, ESE, 2018)
12. Jialong Zhang (MS, ESE, 2018)
13. Hanrui Zou (MS, ESE, 2018)
14. Wenmei Bo (MS, ESE, 2018)
15. Hanyu Feng (MS, ESE, 2018)
16. Joseph Han (MS, ESE, 2018)
17. Zachary Pewitt (MS, ESE, 2018)
18. Chunyuan Li (MS, CSE, 2018)

### Undergraduate students supervised at WUSTL

1. Jason Liao (BS, CSE, 2018-2019)
2. Ray Wu (BS, CSE, 2018-2019)
3. Julia Dai (REU, WUSTL, 2019)
4. Ishika Jain (REU, Cornell University, 2019)
5. Tram-Anh Nguyen (REU, George Mason University, 2019)
6. Jhoan Hernandez (REU, Benedict College, 2018)
7. Gustavo Gratacos (REU, University of Puerto Rico, 2018)
8. Sergio Goodwin (REU, Morehouse College, 2018)

## Student supervision (cont)

1. Xiangyi Xu, “Embedded Sensing System for Whispering-Gallery-Mode Optical Resonators,” Ph.D., Electrical and Systems Engineering, WUSTL, St. Louis, MO, USA, August 2019.
2. Darko Ivanovich, “Polarization Division Multiplexing for Optical Data Communications,” D.Sc., Computer Science and Engineering, WUSTL, St. Louis, MO, USA, August 2019.
3. Liu Chen, “Structured Indoor Modeling,” Ph.D., Computer Science and Engineering, WUSTL, St. Louis, MO, USA, May 2019.
4. Zhiyang Huang, “Toward Controllable and Robust Algorithms for Surface Reconstruction from Spatial Curves,” Ph.D., Computer Science and Engineering, WUSTL, St. Louis, MO, USA, May 2019.
5. Diego Carrera, “Learning and adaptation to detect changes and anomalies in high-dimensional data,” Ph.D., Doctoral Program in Information Technology, Politecnico di Milano, Milan, Italy, November 2018.
6. 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
7. Homayoon Ranjbar, “Reconstruction Algorithms for Novel Joint Imaging Techniques in PET,” Ph.D., Electrical and Systems Engineering, WUSTL, St. Louis, MO, USA, December 2017
8. 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)
- Society for Industrial and Applied Mathematics (SIAM)  
Member (2018–present)

### Associate editor

- SPIE Journal of Electronic Imaging (2017–2019)
- IEEE Transactions on Computational Imaging (2019–present)

### Technical committees

- IEEE Technical Committee on Computational Imaging  
Member (2016–present)

## Professional activities and service (cont)

Program chair:

- OSA Mathematics in Imaging, 24-27 June 2019, Munich, Germany
- Biomedical and Astronomical Signal Processing (BASP), 3-8 February 2021, Villars, Switzerland

Workshop organization:

- IMA Computational Imaging, 14-18 October 2019, Minneapolis, MN, USA  
<https://www.ima.umn.edu/2019-2020/SW10.14-18.19>

Tutorial organization:

- IEEE International Symposium on Biomedical Imaging, 3-7 April 2020, Iowa City, IA, US  
“Image Reconstruction Methods in Biomedical Imaging: Reconciling Models and Learning”

Area chair:

- “Computational Imaging” for IEEE ICASSP 2019, Brighton, UK
- “Computational Imaging” for IEEE ICASSP 2017, New Orleans, LA, USA

Conference session organization:

- “Recent Progress in Computational Microscopy” at Electronic Imaging 2020
- “Recent Advances in Signal Processing for Large-Scale Computational Imaging” at IEEE ICASSP 2019
- “Computational Biomedical Imaging” at BASP 2019
- “Large-Scale Computational Imaging with Wave Models,” IEEE ICASSP 2017

Reviewer for journals

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

Reviewer for conferences

- ICML
- NeurIPS
- ICASSP
- ICIP
- ICCV LCI
- EUSIPCO
- OSA MATH
- ICCP
- ISIT
- ICME
- CAMSAP
- ITW
- ISBI
- SPIE DCS

## Other experiences

- Advisory board member for the “St. Louis International Mentoring Program” (2019-present)
- Expert advisory panel member for the non-profit “Buyuk Kelajak” (2018-2019).
- Student representative for Communication Systems Department at EPFL (2008–2011).
- Founded an educational consultancy company “G.e.P. Solutions” (2010–2013).
- Committee member of Erasmus Student Network chapter of EPFL (2009).
- Member of the coaching team for new undergraduate students at EPFL (2009).

## Language skills

- English, French, German, Russian, and Uzbek (fluent in all).

## Biography

**Ulugbek S. Kamilov** is Assistant Professor and Group Leader of Computational Imaging Group (CIG) at Washington University in St. Louis. His research area is computational imaging with an emphasis on the development of new methods for reliable acquisition, efficient processing, and automated analysis of spatiotemporal data. His research interests include optimization, machine learning, as well as large-scale data processing. He obtained the BSc and MSc degrees in Communication Systems, and the PhD degree in Electrical Engineering from EPFL, Switzerland, in 2008, 2011, and 2015, respectively. From 2015 to 2017, he was a Research Scientist at Mitsubishi Electric Research Laboratories (MERL), Cambridge, MA, USA. He is a recipient of the IEEE Signal Processing Society's 2017 Best Paper Award (with V. K. 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. He is serving as Associate Editor of IEEE Transactions on Computational Imaging (2019-present) and is a member of IEEE Technical Committee on Computational Imaging (2016-2019, 2019-present).