# Soheil Kolouri

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## Research Interests

2010 – Mathematical Machine Learning, Computer Vision, Computational Optimal Transport, Continual/Lifelong Learning

## Academic Positions

2021– **Assistant Professor**, *Vanderbilt University*, Nashville, TN
Department of Computer Science
Lab: Machine Intelligence and Neural Technologies (MINT)

2021– **Affiliate Faculty Member**, *Vanderbilt University*, Nashville, TN
Vanderbilt Institute for Surgery and Engineering (VISE)

2024– **AI Fellow**, *Vanderbilt University*, Nashville, TN
Vanderbilt Lab for Immersive AI Translation (VALIANT)

2015-2016 **Postdoctoral Research Associate**, *Carnegie Mellon University*, Pittsburgh, PA
Biomedical Engineering Department
Supervisor: Prof. Gustavo K. Rohde

## Industry Positions

2016–2021 **Research Scientist**, *HRL Laboratories*, Malibu, CA
The Intelligent Systems Laboratory (ISL)
PI and Co-PI on projects involving AI for Autonomy

2015–2016 **Algorithm Developer**, *Smoke Detective*, Pittsburgh, PA
Lead Engineer

## Education

2015 **Machine Learning Summer School (MLSS)**, *Max Planck Institute, Tübingen, Germany*

2012–2015 **PhD, Biomedical Engineering**, *Carnegie Mellon University*, Pittsburgh, PA
Advisor: Prof. Gustavo K. Rohde
Thesis: *Transport-Based Pattern Recognition and Image Modeling*

2010–2012 **MS, Electrical & Computer Eng.**, *Colorado State University*, Fort Collins, CO
Advisor: Prof. Mo Azimi
Thesis: *Acoustic Tomography of the Atmosphere via Unscented Kalman Filter*

2006–2010 **BS, Electrical Eng.**, *Sharif University of Technology*, Tehran, Iran
Advisor: Prof. Emad Fatemizadeh
Thesis: *Markov Random Fields in Image Processing*

## Professional Memberships

2020– IEEE Senior Member

2021– ACM Member

## Awards

2024 **NSF CAREER Award**, *Optimal Transport Beyond Probability Measures*

2022 **Best Paper Award**, *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*

2021 **Outstanding Reviewer**, *Neural Information Processing Systems (NeurIPS)*

2021 **Outstanding Reviewer**, *Computer Vision and Pattern Recognition (CVPR)*

2021 **Outstanding Reviewer**, *International Conf. on Learning Representations (ICLR)*

2019 **Outstanding Paper Award**, *HRL Laboratories*, Malibu, CA
Project: Deep Sense Learning

2018 **IR&D Research Award**, *HRL Laboratories*, Malibu, CA
Project: Deep Sense Learning

2017 **IR&D Research Award**, *HRL Laboratories*, Malibu, CA
Project: Zero-Shot Learning

2015 **Outstanding Dissertation Award**, *Carnegie Mellon University*, Pittburgh, PA

2014 **Bertucci Fellowship Award**, *Carnegie Mellon University*, Pittburgh, PA
Outstanding Graduate Student

2011 **Graduate Fellowship Award**, *ECE Dept., Colorado State University*, Fort Collins, CO

2005 **Ranked 20'th**, *Nationwide University Entrance Exam (+300,000 participants)*, Iran

## Research Support

### After my tenure-track position

**Awarded as PI: (Total $2,320,000.0)**

2025 **Toyota Research Award**, Role: PI, Award: $60,000.00
Continual Introspective Learning

2024 **NSF CAREER Award**, Role: PI, Award: $553,564.00
Optimal Transport Beyond Probability Measures for Robust Geometric Representation Learning

2024 **Toyota Research Award**, Role: PI, Award: $60,000.00
Continual Driver Behavior Modeling (CDBM)

2022 **DARPA - AIE, Enabling Confidence**, Role: PI, Award: $870,203.00
Covariance Estimation for Rigorous Treatment of Aleatoric uncertaInty in Neural Networks (CERTAINN)
Co-PI: Prof. Hamed Pirsiavash, UC-Davis

2021 **DARPA - AIE, ShELL**, Role: PI, Award: $775,761.00
Information Distillation for Embodied and Articulate Lifelong Learners (IDEALL)
Co-PI: Prof. Hamed Pirsiavash, UC-Davis

### Awarded as Co-PI: (Total $4,718,186)

2023 **LEAP - SAVE (PI Simaan, Vanderbilt)**, Role: Co-PI, Award: $3,825,236.00
Simulation and Robotics for Accelerating Minimally Invasive Training ...
Other Co-PIs: Dr. Rondi Marie Kauffmann, Dr. Kamran Idrees, . Michael Miga, Prof. Jie Ying Wu

2021 **DARPA - AIE, ShELL (PI Soltoggio, LU, UK)**, Role: Co-PI, Award: $892,950.00
Detect, Modulate, Integrate, & Transfer Shared Experience Lifelong Learning
Other Co-PIs: Prof. Cong Liu, UC Riverside

### Pending as PI (Total $4,200,000.00)

2024 **DARPA AIQ**, Role: PI, Award: $3,000,000.00
OPTIM-AI: Optimal Transport Insights for Mathematical Artificial Intelligence

2024 **NSF Medium**, Role: PI, Award: $1,200,000.00
Reparameterization Techniques for Extreme Model and Data Compression

### Pending as Co-PI (Total $5,115,933.00)

2025 **ARPA-H (PI: Yuankai Huo)**, Role: Co-PI, Award: $4,153,282.00
Self-Correcting Multi-agent AI Decision Support Tool for Improved Lung Cancer Management: Post-Market Monitoring and Clinical Integration for PRECISE-AI

2024 **NSF Medium (PI: Jie Ying Wu)**, Role: Co-PI, Award: $962,651.00
Collaborative Research: SCH: Automation and Scene Reconstruction in Cholecystectomy

### Gifts: (Total $50,000.00)

2022 **Oracle Cloud Computation**, Amount: $50,000.00

**Prior to my tenure-track position**

### Awarded as PI (Total $4,608,309.00)

2019 **DARPA - Seedling**, Role: PI, Award: $586,810.00
Real-World Adversarial Attacks on Artificial Intelligence (RWA3)

2019 **DARPA - LwLL**, Role: PI, Award:$4,021,499.00
Automated Multisource Adaptation via Zero-shot Information Generation (AMAZING)

### Awarded as Co-PI (Total $8,300,000.00)

2018 **DARPA - L2M (PI Pilly)**, Role: Co-PI, Amount $8,300,000.00
Super-Turing Evolving Lifelong Learning Architectures (STELLAR)

## Teaching Experience

Spring 2025 **CS6363 Statistical Foundations of Deep Learning**, *Vanderbilt University*
Primary Instructor, Enrolled: 40/50, Course Evaluation: –/5

Fall 2024 **CS4252/5262 Foundations of Machine Learning**, *Vanderbilt University*
Primary Instructor, Enrolled: 35/30, Course Evaluation: 4.63/5

Spring 2024 **CS8395 Selected Topics in Deep Learning**, *Vanderbilt University*
Primary Instructor, Enrolled: 50/50, Course Evaluation: 4.92/5

Fall 2023 **CS4252/5262 Foundations of Machine Learning**, *Vanderbilt University*
Primary Instructor, Enrolled: 37/30, Course Evaluation: 4.67/5

Spring 2023 **CS8395 Selected Topics in Deep Learning**, *Vanderbilt University*
Primary Instructor, Enrolled: 30/30, Course Evaluation 4.79/5

Fall 2022 **CS4252/5262 Foundations of Machine Learning**, *Vanderbilt University*
Primary Instructor, Enrolled: 25/30, Course Evaluation: 4.44/5

Spring 2022 **CS8395 Selected Topics in Deep Learning**, *Vanderbilt University*
Primary Instructor, Enrolled: 30/30, Course Evaluation: 4.9/5

Fall 2021 **CS4252/5262 Foundations of Machine Learning**, *Vanderbilt University*
Primary Instructor, Enrolled: 24/30, Course Evaluation: 4.71/5

Spring 2015–2016 **BME03-712 Computational Methods for Biological ...**, *Carnegie Mellon University*
Guest Lecturer

Fall 2015 **BME42-672 Fundamentals of Biomedical Imaging ...**, *Carnegie Mellon University*
Guest Lecturer

Spring 2014 **BME03-712 Computational Methods for Biological ...**, *Carnegie Mellon University*
Teaching Assistant

Fall 2013–2014 **BME42-672 Fundamentals of Biomedical Imaging ...**, *Carnegie Mellon University*
Teaching Assistant

## Publications

* *denotes equal contribution, "author" identifies supervised students, and "author" identifies postdoctoral mentees*

### Book Chapters

[B1] Murez*, Zak, **Soheil Kolouri***, David Kriegman, Ravi Ramamoorthi, and Kyungnam Kim. 2020. "Domain Adaptation via Image to Image Translation." Pp. 117–36 in Domain Adaptation in Computer Vision with Deep Learning, edited by H. Venkateswara and S. Panchanathan. Cham: Springer International Publishing.
**[Equal Contribution 30%]**

### Journal

[J30] Bai, Yikun, Huy Tran, Steven B. Damelin, and **Soheil Kolouri**. "Partial transport for point-cloud registration." Sampling Theory, Signal Processing, and Data Analysis, 23, 4 (2025).
**[Contribution 30%][IF _ ]**

[J29] Gao, Yuxiang, Ravindra Duddu, **Soheil Kolouri**, Abhinav Gupta, Pavana Prabhakar. "An inverse design framework for optimizing tensile strength of composite materials based on a CNN surrogate for the phase field fracture model." Composites Part A: Applied Science and Manufacturing, Volume 192, 2025, ISSN 1359-835X.
**[Contribution 20%][IF 8.1]**

[J28] Liu, Xinran, Yikun Bai, Yuzhe Lu, Andrea Soltoggio, and **Soheil Kolouri**. "Wasserstein task embedding for measuring task similarities" Neural Networks, 181, ISSN 0893-6080, 106796.
**[Contribution 25% - DARPA ShELL][IF 6.0]**

[J27] Chang, Shuang, Greyson A. Wintergerst, Camella Carlson, Haoli Yin, Kristen R. Scarpato, Amy N. Luckenbaugh, Sam S. Chang, **Soheil Kolouri**, and Audrey K. Bowden. "Low-cost and label-free blue light cystoscopy through digital staining of white light cystoscopy videos." Nature Communications Medicine 4, no. 1 (2024): 269.
**[Contribution 10%][IF 5.4]**

[J26] Rao, Mingxing, Yinhong Qin, **Soheil Kolouri**, Jie Ying Wu, and Daniel Moyer "Zero-shot prompt-based video encoder for surgical gesture recognition" International Journal of Computer Assisted Radiology and Surgery (2024), 1-11.
**[Contribution 10%][IF 2.3]**

[J25] Soltoggio, Andrea, Eseoghene Ben-Iwhiwhu, Vladimir Braverman, Eric Eaton, Benjamin Epstein, Yunhao Ge, Lucy Halperin, Jonathan How, Laurent Itti, Michael A. Jacobs, Pavan Kantharaju, Long Le, Steven Lee, Xinran Liu, Sildomar T. Monteiro, David Musliner, Saptarshi Nath, Priyadarshini Panda, Christos Peridis, Hamed Pirsiavash, Vishwa Parekh, Kaushik Roy, Shahaf Shperberg, Hava T. Siegelmann, Peter Stone, Kyle Vedder, Jingfeng Wu, Lin Yang, Guangyao Zheng, and **Soheil Kolouri** "A collective AI via lifelong learning and sharing at the edge." Nature Machine Intelligence, 6(3), pp.251-264.
**[Contribution 15% - DARPA ShELL][IF 23.8]**

[J24] Liu, Xinran, Yuzhe Lu, Ali Abbasi, Meiyi Li, Javad Mohammadi, and **Soheil Kolouri** "Teaching networks to solve optimization problems." IEEE Access (2024)
**[Contribution 25%][IF 3.9]**

[J23] Chang, Shuang, Micha E. Bermoy, Sam S. Chang, Kristen R. Scarpato, Amy N. Luckenbaugh, **Soheil Kolouri**, and Audrey K. Bowden. "Enhancing the image quality of blue light cystoscopy through green-hue correction and fogginess removal." Scientific Reports 13, no. 1 (2023): 21484.
**[Contribution 15%][IF 4.847]**

[J22] **Soheil Kolouri**, Ali Abbasi, Soroush Abbasi Koohpayegani, Parsa Nooralinejad, and Hamed Pirsiavash. "Multi-Agent Lifelong Implicit Neural Learning." IEEE Signal Processing Letters (2023).
**[Contribution 50% - DARPA ShELL, PI][IF 3.9]**

[J21] Li, Meiyi, **Soheil Kolouri**, and Javad Mohammadi. "Learning to solve optimization problems with hard linear constraints." IEEE Access (2023).
**[Contribution 20%][IF 3.9]**

[J20] Eseoghene Ben-Iwhiwhu, Saptarshi Nath, Praveen K. Pilly, **Soheil Kolouri**, and Andrea Soltoggio. "Lifelong Reinforcement Learning with Modulating Masks." Transactions on Machine Learning Research (TMLR), 2835-8856, 2023.
**[Contribution 20% - DARPA L2M, Co-PI]**

[J19] Baker, Megan M., Alexander New, Mario Aguilar-Simon, Ziad Al-Halah, Sébastien M. R. Arnold, Ese Ben-Iwhiwhu, Andrew P. Brna, Ethan Brooks, Ryan C. Brown, Zachary Daniels, Anurag Daram, Fabien Delattre, Ryan Dellana, Eric Eaton, Haotian Fu, Kristen Grauman, Jesse Hostetler, Shariq Iqbal, Cassandra Kent, Nicholas Ketz, **Soheil Kolouri**, George Konidaris, Dhireesha Kudithipudi, Erik Learned-Miller, Seungwon Lee, Michael L. Littman, Sandeep Madireddy, Jorge A. Mendez, Eric Q. Nguyen, Christine Piatko, Praveen K. Pilly, Aswin Raghavan, Abrar Rahman, Santhosh Kumar Ramakrishnan, Neale Ratzlaff, Andrea Soltoggio, Peter Stone, Indranil Sur, Zhipeng Tang, Saket Tiwari, Kyle Vedder, Felix Wang, Zifan Xu, Angel Yanguas-Gil, Harel Yedidsion, Shangqun Yu, and Gautam K. Vallabha. 2023. "A Domain-Agnostic Approach for Characterization of Lifelong Learning Systems." Neural Networks 160:274–96. DOI: 10.1016/j.neunet.2023.01.007.
**[Contribution 3% - DARPA L2M, Program Paper, Co-PI][IF 9.7]**

[J18] Kudithipudi, Dhireesha, Mario Aguilar-Simon, Jonathan Babb, Maxim Bazhenov, Douglas Blackiston, Josh Bongard, Andrew P. Brna, Suraj Chakravarthi Raja, Nick Cheney, Jeff Clune, Anurag Daram, Stefano Fusi, Peter Helfer, Leslie Kay, Nicholas Ketz, Zsolt Kira, **Soheil Kolouri**, Jeffrey L. Krichmar, Sam Kriegman, Michael Levin, Sandeep Madireddy, Santosh Manicka, Ali Marjaninejad, Bruce McNaughton, Risto Miikkulainen, Zaneta Navratilova, Tej Pandit, Alice Parker, Praveen K. Pilly, Sebastian Risi, Terrence J. Sejnowski, Andrea Soltoggio, Nicholas Soures, Andreas S. Tolias, Darío Urbina-Meléndez, Francisco J. Valero-Cuevas, Gido M. van de Ven, Joshua T. Vogelstein, Felix Wang, Ron Weiss, Angel Yanguas-Gil, Xinyun Zou, and Hava Siegelmann. 2022. "Biological Underpinnings for Lifelong Learning Machines." Nature Machine Intelligence 4(3):196–210. DOI: 10.1038/s42256-022-00452-0.
**[Contribution 3% - DARPA L2M, Program Paper, Co-PI][IF 25.9]**

[J17] Rostami, Mohammad, **Soheil Kolouri**, Zak Murez, Yuri Owechko, Eric Eaton, and Kuyngnam Kim. 2022. "Zero-Shot Image Classification Using Coupled Dictionary Embedding." Machine Learning with Applications 8:100278. DOI: 10.1016/j.mlwa.2022.100278.
**[Contribution 40%][IF 3.2]**

[J16] Shifat-E-Rabbi, Mohammad, Xuwang Yin, Abu Hasnat Mohammad Rubaiyat, Shiying Li, **Soheil Kolouri**, Akram Aldroubi, Jonathan M. Nichols, and Gustavo K. Rohde. 2021. "Radon Cumulative Distribution Transform Subspace Modeling for Image Classification." Journal of Mathematical Imaging and Vision 63(9):1185–1203. DOI: 10.1007/s10851-021-01052-0.
**[Contribution 10% - Based on My Dissertation][IF 1.6]**

[J15] Ladosz, Pawel, Eseoghene Ben-Iwhiwhu, Jeffery Dick, Nicholas Ketz, **Soheil Kolouri**, Jeffrey L. Krichmar, Praveen K. Pilly, and Andrea Soltoggio. 2022. "Deep Reinforcement Learning With Modulated Hebbian Plus Q-Network Architecture." IEEE Transactions on Neural Networks and Learning Systems 33(5):2045–56. DOI: 10.1109/TNNLS.2021.3110281.
**[Contribution 5% - DARPA L2M, STELLAR Team, Co-PI][IF 14.3]**

[J14] Zou, Xinyun, **Soheil Kolouri**, Praveen K. Pilly, and Jeffrey L. Krichmar. 2020. "Neuromodulated Attention and Goal-Driven Perception in Uncertain Domains." Neural Networks 125:56–69. DOI: 10.1016/j.neunet.2020.01.031.
**[Contribution 25% - DARPA L2M, STELLAR Team, Co-PI][IF 9.7]**

[J13] Dick, Jeffery, Pawel Ladosz, Eseoghene Ben-Iwhiwhu, Hideyasu Shimadzu, Peter Kinnell, Praveen K. Pilly, **Soheil Kolouri**, and Andrea Soltoggio. 2020. "Detecting Changes and Avoiding Catastrophic Forgetting in Dynamic Partially Observable Environments." Frontiers in Neurorobotics 14:578675. DOI: 10.3389/fnbot.2020.578675.
**[Contribution 10% - DARPA L2M, STELLAR Team, Co-PI][IF 4.1]**

[J12] Rostami, Mohammad, Soheil Kolouri, Eric Eaton, and Kyungnam Kim. 2019. "Deep Transfer Learning for Few-Shot SAR Image Classification." Remote Sensing 11(11):1374. DOI: 10.3390/rs11111374.
**[Contribution 40%][IF 4.5]**

[J11] Kundu, Shinjini, Soheil Kolouri, Kirk I. Erickson, Arthur F. Kramer, Edward McAuley, and Gustavo K. Rohde. 2018. "Discovery and Visualization of Structural Biomarkers from MRI Using Transport-Based Morphometry." NeuroImage 167:256–75. DOI: 10.1016/j.neuroimage.2017.11.006.
**[Contribution 25% - Based on My Dissertation][IF 7.4]**

[J10] Park, Se Rim, **Soheil Kolouri**, Shinjini Kundu, and Gustavo K. Rohde. 2018. "The Cumulative Distribution Transform and Linear Pattern Classification." Applied and Computational Harmonic Analysis 45(3):616–41. DOI: 10.1016/j.acha.2017.02.002.
**[Contribution 25%][IF 3.0]**

[J9] **Kolouri, Soheil**, Se Rim Park, and Gustavo K. Rohde. 2016. "The Radon Cumulative Distribution Transform and Its Application to Image Classification." IEEE Transactions on Image Processing 25(2):920–34. DOI: 10.1109/TIP.2015.2509419.
**[Contribution 50%][IF 10.9]**

[J8] **Kolouri, Soheil**, Akif B. Tosun, John A. Ozolek, and Gustavo K. Rohde. 2016. "A Continuous Linear Optimal Transport Approach for Pattern Analysis in Image Datasets." Pattern Recognition 51:453–62. DOI: 10.1016/j.patcog.2015.09.019.
**[Contribution 50%][IF 7.2]**

[J7] Thorpe, Matthew, Serim Park, **Soheil Kolouri**, Gustavo K. Rohde, and Dejan Slepčev. 2017. "A Transportation $L^p$ Distance for Signal Analysis." Journal of Mathematical Imaging and Vision 59(2):187–210. DOI: 10.1007/s10851-017-0726-4.
**[Contribution 10%][IF 1.6]**

[J6] Tosun, Akif Burak, Oleksandr Yergiyev, **Soheil Kolouri**, Jan F. Silverman, and Gustavo K. Rohde. 2015. "Detection of Malignant Mesothelioma Using Nuclear Structure of Mesothelial Cells in Effusion Cytology Specimens: Mesothelioma Detection From Effusion Fluid" edited by G. K. Rohde. Cytometry Part A 87(4):326–33. DOI: 10.1002/cyto.a.22602.
**[Contribution 20%][IF 4.3]**

[J5] Shembel, Adrianna, **Soheil Kolouri**, Hongming Xu, and Katherine Verdolini Abbott. 2016. "Quantification of Respiratory Laryngeal Morphometry: Comparison of Laryngeal Lumen Angle Estimate Methods." Journal of Voice 30(6):764.e23-764.e37. DOI: 10.1016/j.jvoice.2015.10.011.
**[Contribution 20%][IF 2.0]**

[J4] Basu*, Saurav, **Soheil Kolouri***, and Gustavo K. Rohde. 2014. "Detecting and Visualizing Cell Phenotype Differences from Microscopy Images Using Transport-Based Morphometry." Proceedings of the National Academy of Sciences 111(9):3448–53. DOI: 10.1073/pnas.1319779111.
**[Equal Contribution 40%][IF 12.8]**

[J3] Ozolek, John A., Akif Burak Tosun, Wei Wang, Cheng Chen, **Soheil Kolouri**, Saurav Basu, Hu Huang, and Gustavo K. Rohde. 2014. "Accurate Diagnosis of Thyroid Follicular Lesions from Nuclear Morphology Using Supervised Learning." Medical Image Analysis 18(5):772–80. DOI: 10.1016/j.media.2014.04.004.
**[Contribution 3%][IF 13.8]**

[J2] **Kolouri, Soheil**, Mahmood R. Azimi-Sadjadi, and Astrid Ziemann. 2014. "Acoustic Tomography of the Atmosphere Using Unscented Kalman Filter." IEEE Transactions on Geoscience and Remote Sensing 52(4):2159–71. DOI: 10.1109/TGRS.2013.2258401.
**[Contribution 60%][IF 5.6]**

[J1] **Kolouri, Soheil**, Mahmood R. Azimi-Sadjadi, and Astrid Ziemann. 2014. "A Statistical-Based Approach for Acoustic Tomography of the Atmosphere." The Journal of the Acoustical Society of America 135(1):104–14. DOI: 10.1121/1.4835875.
**[Contribution 60%][IF 2.5]**

### Magazine

[M2] **Kolouri, Soheil**, Xuwang Yin, and Gustavo K. Rohde. 2020. "Neural Networks, Hypersurfaces, and the Generalized Radon Transform [Lecture Notes]." IEEE Signal Processing Magazine 37(4):123–33. DOI: 10.1109/MSP.2020.2978822.
**[Contribution 60%][IF 12.5]**

[M1] **Kolouri, Soheil**, Se Rim Park, Matthew Thorpe, Dejan Slepcev, and Gustavo K. Rohde. 2017. "Optimal Mass Transport: Signal Processing and Machine-Learning Applications." IEEE Signal Processing Magazine 34(4):43–59. DOI: 10.1109/MSP.2017.2695801.
**[Contribution 40%][IF 12.5]**

## Highly Selective Conference

[H33] Thrash, Chayne, Reed Andreas, Ali Abbasi, Parsa Nooralinejad, Soroush Abbasi Koohpayegani, Hamed Pirsiavash, and **Soheil Kolouri** "MCNC: Manifold-Constrained Reparameterization for Neural Compression." The Thirteenth International Conference on Learning Representations (ICLR), 2025.
**[Contribution 15%][Acceptance Rate 31.75%]**

[H32] Yikun Bai, Abihith Kothapalli, Hengrong Du, Rocío Díaz Martín, and **Soheil Kolouri** "Linear Partial Gromov-Wasserstein Embedding." The Thirteenth International Conference on Learning Representations (ICLR), 2025.
**[Contribution 10%][Acceptance Rate 31.75%]**

[H31] Yikun Bai, Rocío Díaz Martín, Abihith Kothapalli, Hengrong Du, Liu, Xinran, and **Soheil Kolouri** "Partial Gromov-Wasserstein Metric." The Thirteenth International Conference on Learning Representations (ICLR), 2025.
**[Contribution 10%][Acceptance Rate 31.75%]**

[H30] Liu, Xinran, Yikun Bai, Rocío Díaz Martín, Kaiwen Shi, Ashkan Shahbazi, Bennett A. Landman, Catie Chang, and **Soheil Kolouri** "Linear Spherical Sliced Optimal Transport: A Fast Metric for Comparing Spherical Data." The Thirteenth International Conference on Learning Representations (ICLR), 2025.
**[Contribution 10%][Acceptance Rate 31.75%]**

[H29] Liu, Xinran, Rocío Díaz Martín, Yikun Bai, Ashkan Shahbazi, Matthew Thorpe, Akram Aldroubi, and **Soheil Kolouri** "Expected sliced transport plans." The Thirteenth International Conference on Learning Representations (ICLR), 2025.
**[Contribution 15%][Acceptance Rate 31.75%]**

[H28] Li, Yamin, Ange Lou, Ziyuan Xu, Shengchao Zhang, Shiyu Wang, Dario J. Englot, **Soheil Kolouri**, Daniel Moyer, Roza G. Bayrak, and Catie Chang, "NeuroBOLT: Resting-state EEG-to-fMRI Synthesis with Multi-dimensional Feature Mapping" The Thirty-eighth Annual Conference on Neural Information Processing Systems (NeurIPS), 2024.
**[Contribution 5%][Acceptance Rate 25.8%]**

[H27] Tran, Huy*, Abihith Kothapalli*, Yikun Bai*, Ashkan Shahbazi, Xinran Liu, Rocio Diaz Martin, and **Soheil Kolouri** "Stereographic Spherical Sliced Wasserstein Distances" Proceedings of the 41st International Conference on Machine Learning (ICML), 2024.
**[Contribution 30% - MINT Lab][Spotlight - Acceptance Rate 2.01%]**

[H26] Abbasi, Ali, Parsa Nooralinejad, Hamed Pirsiavash, and **Soheil Kolouri**. "BrainWash: A Poisoning Attack to Forget in Continual Learning" To Appear In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024.
**[Contribution 30% - MINT Lab][Acceptance Rate 23.6%]**

[H25] Martin, Rocio Diaz, Ivan Medri, Yikun Bai, Xinran Liu, Kangbai Yan, Gustavo K Rohde, and **Soheil Kolouri**. "LCOT: Linear Circular Optimal Transport." In The Twelfth International Conference on Learning Representations (ICLR), 2024.
**[Contribution 30% - PI][Acceptance Rate 30.0%]**

[H24] Koohpayegani, Soroush Abbasi, K. L. Navaneet, Parsa Nooralinejad, **Soheil Kolouri**, and Hamed Pirsiavash. "NOLA: Networks as Linear Combination of Low Rank Random Basis." In The Twelfth International Conference on Learning Representations (ICLR), 2024.
**[Contribution 10% - DARPA ShELL PI][Acceptance Rate 30.0%]**

[H23] Lu, Yuzhe, Xinran Liu, Andrea Soltoggio, and **Soheil Kolouri**. "SLOSH: Set locality sensitive hashing via sliced-Wasserstein embeddings." In Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision, pp. 2566-2576. 2024.
**[Contribution 30% - DARPA ShELL, PI][Acceptance Rate 30.0%]**

[H22] Lu, Yuzhe, Yilong Qin, Runtian Zhai, Andrew Shen, Ketong Chen, Zhenlin Wang, **Soheil Kolouri**, Simon Stepputtis, Joseph Campbell, and Katia Sycara. Characterizing Out-of-Distribution Error via Optimal Transport. In the thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023.
**[Contribution 10%][Acceptance Rate 26.0%]**

[H21] Bai, Yikun, Ivan Vladimir Medri, Rocio Diaz Martin, Rana Shahroz, and **Soheil Kolouri**. "Linear optimal partial transport embedding." In International Conference on Machine Learning (ICML), pp. 1492-1520. PMLR, 2023.
**[Contribution 25% - MINT Lab][Acceptance Rate 27.9%]**

[H20] Nooralinejad, Parsa, Ali Abbasi, Soroush Abbasi Koohpayegani, Kossar Pourahmadi Meibodi, Rana Muhammad Shahroz Khan, **Soheil Kolouri**, and Hamed Pirsiavash. "PRANC: Pseudo random networks for compacting deep models." In Proceedings of the IEEE/CVF International Conference on Computer Vision, pp. 17021-17031. 2023.
**[Contribution 20% - DARPA ShELL, PI][Acceptance Rate 26.8%]**

[H19] Bai, Yikun, Bernard Schmitzer, Mathew Thorpe, and **Soheil Kolouri**. 2023. "Sliced Optimal Partial Transport." In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), pp. 13681-13690. 2023.
**[Contribution 25% - MINT Lab][Acceptance Rate 25.8%]**

[H18] Naderializadeh*, Navid, Joseph F. Comer, Reed W. Andrews, Heiko Hoffmann, and **Soheil Kolouri*** "Pooling by Sliced-Wasserstein Embedding." Pp. 3389–3400 in Advances in Neural Information Processing Systems. Vol. 34. Curran Associates, Inc.
**[Equal Contribution 40%][Acceptance Rate 25.8%]**

[H17] Li, Haoran, Aditya Krishnan, Jingfeng Wu, **Soheil Kolouri**, Praveen K. Pilly, and Vladimir Braverman. 2021. "Lifelong Learning with Sketched Structural Regularization." Pp. 985–1000 in Proceedings of The 13th Asian Conference on Machine Learning. PMLR.
**[Contribution 15%][Acceptance Rate 26.9%]**

[H16] **Kolouri, Soheil**, Navid Naderializadeh, Gustavo K. Rohde, and Heiko Hoffmann. 2021. "Wasserstein Embedding for Graph Learning." International Conference on Learning Representations.
**[Contribution 50%][Acceptance Rate 28.7%]**

[H15] Nadjahi, Kimia, Alain Durmus, Lénaïc Chizat, **Soheil Kolouri**, Shahin Shahrampour, and Umut Simsekli. 2020. "Statistical and Topological Properties of Sliced Probability Divergences." Pp. 20802–12 in Advances in Neural Information Processing Systems. Vol. 33. Curran Associates, Inc.
**[Contribution 10%][Acceptance Rate 28.7%]**

[H14] **Kolouri*, Soheil**, Aniruddha Saha*, Hamed Pirsiavash, and Heiko Hoffmann. 2020. "Universal Litmus Patterns: Revealing Backdoor Attacks in CNNs." Pp. 298–307 in 2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR).
**[Equal Contribution 35%][Oral Presentation, Acceptance Rate 5.7%]**

[H13] **Kolouri, Soheil**, Nicholas A. Ketz, Andrea Soltoggio, and Praveen K. Pilly. 2020. "Sliced Cramer Synaptic Consolidation for Preserving Deeply Learned Representations." International Conference on Learning Representations.
**[Contribution 60%][Acceptance Rate 26.5%]**

[H12] Rostami, Mohammad, **Soheil Kolouri**, Praveen Pilly, and James McClelland. 2020. "Generative Continual Concept Learning." Proceedings of the AAAI Conference on Artificial Intelligence 34(04):5545–52. DOI: 10.1609/aaai.v34i04.6006.
**[Contribution 30%][Acceptance Rate 20.6%]**

[H11] **Kolouri*, Soheil**, Kimia Nadjahi*, Umut Simsekli, Roland Badeau, and Gustavo Rohde. 2019. "Generalized Sliced Wasserstein Distances." in Advances in Neural Information Processing Systems. Vol. 32. Curran Associates, Inc.
**[Equal Contribution 30%][Acceptance Rate 21.6%]**

[H10] Pope*, Phillip E., **Soheil Kolouri***, Mohammad Rostami, Charles E. Martin, and Heiko Hoffmann. 2019. "Explainability Methods for Graph Convolutional Neural Networks." Pp. 10764–73 in 2019 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR). Long Beach, CA, USA: IEEE.
**[Equal Contribution 35%][Oral Presentation, Acceptance Rate 5.5%]**

[H9] Rostami, Mohammad, **Soheil Kolouri**, and Praveen K. Pilly. 2019. "Complementary Learning for Overcoming Catastrophic Forgetting Using Experience Replay." Pp. 3339–45 in Proceedings of the 28th International Joint Conference on Artificial Intelligence, IJCAI'19. Macao, China: AAAI Press.
**[Contribution 25%][Acceptance Rate 17.9%]**

[H8] **Kolouri, Soheil**, Phillip E. Pope, Charles E. Martin, and Gustavo K. Rohde. 2019. "Sliced Wasserstein Auto-Encoders." International Conference on Learning Representations (ICLR), 2019.
**[Contribution 60%][Acceptance Rate 31.4%]**

[H7] **Kolouri, Soheil**, Gustavo K. Rohde, and Heiko Hoffmann. 2018. "Sliced Wasserstein Distance for Learning Gaussian Mixture Models." Pp. 3427–36 in 2018 IEEE/CVF Conference on Computer Vision and Pattern Recognition.
**[Contribution 60%][Acceptance Rate 29.1%]**

[H6] Murez, Zak, **Soheil Kolouri**, David Kriegman, Ravi Ramamoorthi, and Kyungnam Kim. 2018. "Image to Image Translation for Domain Adaptation." Pp. 4500–4509 in 2018 IEEE/CVF Conference on Computer Vision and Pattern Recognition. Salt Lake City, UT: IEEE.
**[Contribution 30%][Acceptance Rate 29.1%]**

[H5] **Kolouri, Soheil**, Mohammad Rostami, Yuri Owechko, and Kyungnam Kim. 2018. "Joint Dictionaries for Zero-Shot Learning." Proceedings of the AAAI Conference on Artificial Intelligence 32(1). DOI: 10.1609/aaai.v32i1.11649.
**[Contribution 50%][Acceptance Rate 25.7%]**

[H4] Rostami, Mohammad, **Soheil Kolouri**, Kyungnam Kim, and Eric Eaton. 2018. "Multi-Agent Distributed Lifelong Learning for Collective Knowledge Acquisition." Pp. 712–20 in Proceedings of the 17th International Conference on Autonomous Agents and Multi-Agent Systems, AAMAS '18. Richland, SC: International Foundation for Autonomous Agents and Multiagent Systems.
**[Contribution 20%][Acceptance Rate 25%]**

[H3] Deutsch, Shay, **Soheil Kolouri**, Kyungnam Kim, Yuri Owechko, and Stefano Soatto. 2017. "Zero Shot Learning via Multi-Scale Manifold Regularization." Pp. 5292–99 in 2017 IEEE Conference on Computer Vision and Pattern Recognition (CVPR). Honolulu, HI: IEEE.
**[Contribution 20%][Acceptance Rate 29.9%]**

[H2] **Kolouri, Soheil**, Yang Zou, and Gustavo K. Rohde. 2016. "Sliced Wasserstein Kernels for Probability Distributions." Pp. 5258–67 in 2016 IEEE Conference on Computer Vision and Pattern Recognition (CVPR). Las Vegas, NV, USA: IEEE.
**[Contribution 60%][Acceptance Rate 29.9%]**

[H1] **Kolouri, Soheil**, and Gustavo K. Rohde. 2015. "Transport-Based Single Frame Super Resolution of Very Low Resolution Face Images." Pp. 4876–84 in 2015 IEEE Conference on Computer Vision and Pattern Recognition (CVPR). Boston, MA, USA: IEEE.
**[Contribution 70%][Acceptance Rate 28.3%]**

Conference

[C15] Jeffery Dick, Saptarshi Nath, Christos Peridis, Eseoghene Benjamin, **Soheil Kolouri**, and Andrea Soltoggio. 2023. "Statistical Context Detection for Deep Lifelong Reinforcement Learning" Pp. 936–960 in Proceedings of The 3rd Conference on Lifelong Learning Agents. PMLR.
**[Contribution 10%]**

[C14] Saptarshi Nath, Christos Peridis, Eseoghene Ben-Iwhiwhu, Xinran Liu, Shirin Dora, Cong Liu, **Soheil Kolouri**, Andrea Soltoggio. 2023. "Sharing Lifelong Reinforcement Learning Knowledge via Modulating Masks." Pp. 936–960 in Proceedings of The 2nd Conference on Lifelong Learning Agents. PMLR.
**[Contribution 30% - MINT Lab]**

[C13] Li, Meiyi, **Soheil Kolouri**, and Javad Mohammadi. "Learning to Optimize Distributed Optimization: ADMM-based DC-OPF Case Study." In 2023 IEEE Power & Energy Society General Meeting (PESGM), pp. 1-5. IEEE, 2023.
**[Contribution 20%]**

[C12] Wu, Zihao, Huy Tran, Hamed Pirsiavash, and **Soheil Kolouri**. 2023. "Is Multi-Task Learning an Upper Bound for Continual Learning?" IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP).
**[Contribution 50% - MINT Lab]**

[C11] Ali Abbasi, Parsa Nooralinejad, Vladimir Braverman, Hamed Pirsiavash, and **Soheil Kolouri**. 2022. "Sparsity and Heterogeneous Dropout for Continual Learning in the Null Space of Neural Activations." Pp. 617–28 in Proceedings of The 1st Conference on Lifelong Learning Agents. PMLR.
**[Contribution 30% - MINT Lab]**

[C10] **Kolouri, Soheil**, Kimia Nadjahi, Shahin Shahrampour, and Umut Simsekli. 2022. "Generalized Sliced Probability Metrics." Pp. 4513–17 in ICASSP 2022 - 2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). Singapore, Singapore: IEEE.
**[Best Paper Award][Contribution 50%]**

[C9] Comer, Joseph F., Reed W. Andrews, Navid Naderializadeh, **Soheil Kolouri**, and Heiko Hoffman. 2020. "SAR Automatic Target Recognition with Less Labels." P. 29 in Automatic Target Recognition XXX, edited by T. L. Overman, R. I. Hammoud, and A. Mahalanobis. Online Only, United States: SPIE.
**[Contribution 15%]**

[C8] Gabourie, Alexander J., Mohammad Rostami, Philip E. Pope, **Soheil Kolouri**, and Kuyngnam Kim. 2019. "Learning a Domain-Invariant Embedding for Unsupervised Domain Adaptation Using Class-Conditioned Distribution Alignment." Pp. 352–59 in 2019 57th Annual Allerton Conference on Communication, Control, and Computing (Allerton). Monticello, IL, USA: IEEE.
**[Contribution 20%]**

[C7] **Kolouri, Soheil**, Dejan Slepcev, and Gustavo K. Rohde. 2015. "A Symmetric Deformation-Based Similarity Measure for Shape Analysis." Pp. 314–18 in 2015 IEEE 12th International Symposium on Biomedical Imaging (ISBI).
**[Contribution 60%]**

[C6] **Kolouri, Soheil**, and Gustavo K. Rohde. 2015. "PCA-Based Super-Resolution in Transport Space." P. CTh3E.2 in Imaging and Applied Optics 2015 (2015), paper CTh3E.2. Optica Publishing Group.
**[Contribution 60%]**

[C5] **Kolouri, Soheil**, and Gustavo K. Rohde. 2014. "Temporal Information Inference from Static High-Content Fluorescent Microscopy." Pp. 1–2 in 2014 40th Annual Northeast Bioengineering Conference (NEBEC).
**[Contribution 60%]**

[C4] **Kolouri, Soheil**, Saurav Basu, and Gustavo K. Rohde. 2014. "Learning and Visualizing Statistical Relationships between Protein Distributions from Microscopy Images." Pp. 381–84 in 2014 IEEE 11th International Symposium on Biomedical Imaging (ISBI).
**[Contribution 50%]**

[C3] Tosun, Akif Burak, Oleksandr Yergiyev, **Soheil Kolouri**, Jan F. Silverman, and Gustavo K. Rohde. 2014. "Novel Computer-Aided Diagnosis of Mesothelioma Using Nuclear Structure of Mesothelial Cells in Effusion Cytology Specimens." P. 90410Z in, edited by M. N. Gurcan and A. Madabhushi. San Diego, California, USA.
**[Contribution 15%]**

[C2] **Kolouri, Soheil**, and Gustavo K. Rohde. 2014. "Quantifying and Visualizing Variations in Sets of Images Using Continuous Linear Optimal Transport." P. 903438 in, edited by S. Ourselin and M. A. Styner. San Diego, California, USA.
**[Contribution 60%]**

[C1] **Kolouri, Soheil**, and Mahmood R. Azimi-Sadjadi. 2012. "Acoustic Tomography of the Atmosphere Using Unscented Kalman Filter." Pp. 2531–35 in 2012 Proceedings of the 20th European Signal Processing Conference (EUSIPCO).
**[Contribution 60%]**

Workshop

[W6] Liu, Xinran, Yikun Bai, Huy Tran, Zhanqi Zhu, Matthew Thorpe, and **Soheil Kolouri**. "PTLP: Partial Transport $L^p$ Distances." In NeurIPS 2023 Workshop Optimal Transport and Machine Learning. 2023.
**[Contribution 20%]**

[W5] Yuzhe Lu, Yilong Qin, Runtian Zhai, Andrew Shen, Ketong Chen, Zhenlin Wang, **Soheil Kolouri**, Simon Stepputtis, Joseph Campbell, and Katia Sycara. 2023. "Characterizing Out-of-Distribution Error via Optimal Transport." In NeurIPS 2023 Workshop Optimal Transport and Machine Learning.
**[Contribution 10%]**

[W4] Mohammadi, Javad, and **Soheil Kolouri.** 2019. "Collaborative Learning Through Shared Collective Knowledge and Local Expertise." Pp. 1–6 in 2019 IEEE 29th International Workshop on Machine Learning for Signal Processing (MLSP).
**[Contribution 50%]**

[W3] Rostami, Mohammad, **Soheil Kolouri**, Eric Eaton, and Kyungnam Kim. 2019. "SAR Image Classification Using Few-Shot Cross-Domain Transfer Learning." Pp. 907–15 in 2019 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW).
**[Contribution 25%]**

[W2] **Kolouri, Soheil**, Charles E. Martin, and Heiko Hoffmann. 2017. "Explaining Distributed Neural Activations via Unsupervised Learning." Pp. 1670–78 in 2017 IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW).
**[Contribution 60%]**

[W1] Rahimi, Amir M., **Soheil Kolouri**, and Rajan Bhattacharyya. 2017. "Automatic Tactical Adjustment in Real-Time: Modeling Adversary Formations with Radon-Cumulative Distribution Transform and Canonical Correlation Analysis." Pp. 139–46 in 2017 IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW).
**[Contribution 40%]**

## Patents

[P24] **Soheil Kolouri**, Heiko Hoffmann, and David Payton. "Process to make machine object detection robust to adversarial attacks." U.S. Patent 120,08,079, issued July 11, 2024.
**[Contribution 60%]**

[P23] **Soheil Kolouri**, Phillip E. Pope, Mohammad Rostami, Charles E. Martin, and Heiko Hoffmann. "System and method for discovering chemically active compounds of a molecule." U.S. Patent 11,791,018, issued October 17, 2023.
**[Contribution 60%]**

[P22] **Soheil Kolouri**, and Heiko Hoffmann. "System and method for detecting backdoor attacks in convolutional neural networks." U.S. Patent 11,550,914, issued January 10, 2023.
**[Contribution 60%]**

[P21] Kim, Hyun Tiffany J., Rajan Bhattacharyya, Samuel D. Johnson, **Soheil Kolouri**, Christian Lebiere, and Jiejun Xu. "Continuously habituating elicitation strategies for social-engineering-attacks (CHESS)." U.S. Patent 11,494,486, issued November 8, 2022.
**[Contribution 10%]**

[P20] Rostami, Mohammad, and **Soheil Kolouri**. "System and method for transferring electro-optical (EO) knowledge for synthetic-aperture-radar (SAR)-based object detection." U.S. Patent 11,448,753, issued September 20, 2022.
**[Contribution 50%]**

[P19] Kabakian, Adour V., **Soheil Kolouri**, Brian N. Limketkai, and Shankar R. Rao. "Stripmap synthetic aperture radar (SAR) system utilizing direct matching and registration in range profile space." U.S. Patent 11,333,753, issued May 17, 2022.
**[Contribution 25%]**

[P18] Rahimi, Amir M., Hyukseong Kwon, Heiko Hoffmann, and **Soheil Kolouri**. "Learning actions with few labels in the embedded space." U.S. Patent 11,288,498, issued March 29, 2022.
**[Contribution 30%]**

[P17] **Soheil Kolouri** and Shankar R. Rao. "Synthetic aperture radar (SAR) based convolutional navigation." U.S. Patent 11,255,960, issued February 22, 2022.
**[Contribution 60%]**

[P16] **Soheil Kolouri**, Nicholas A. Ketz, Praveen K. Pilly, Charles E. Martin, and Michael D. Howard. "Artificial neural networks having attention-based selective plasticity and methods of training the same." U.S. Patent 11,210,559, issued December 28, 2021.
**[Contribution 30%]**

[P14] Gabourie, Alexander J., Mohammad Rostami, **Soheil Kolouri**, and Kyungnam Kim. "System and method for unsupervised domain adaptation via sliced-Wasserstein distance." U.S. Patent 11,176,477, issued November 16, 2021.
**[Contribution 20%]**

[P13] Rao, Shankar R., Kang-Yu Ni, and **Soheil Kolouri**. "Transport-based synthetic aperture radar navigation systems and methods." U.S. Patent 11,169,258, issued November 9, 2021.
**[Contribution 40%]**

[P12] Martin, Charles E., Nicholas A. Ketz, Praveen K. Pilly, **Soheil Kolouri**, Michael D. Howard, and Nigel D. Stepp. "Artificial neural network and method of training an artificial neural network with epigenetic neurogenesis." U.S. Patent 11,113,597, issued September 7, 2021.
**[Contribution 10%]**

[P11] **Soheil Kolouri**, and Heiko Hoffmann. "System and method for estimating the uncertainty of the decisions made by a supervised machine learner." U.S. Patent 11,086,299, issued August 10, 2021.
**[Contribution 60%]**

[P10] **Soheil Kolouri**, Charles E. Martin, and Heiko Hoffmann. "Machine-vision method to classify input data based on object components." U.S. Patent 11,023,789, issued June 1, 2021.
**[Contribution 50%]**

[P9] Rahimi, Amir M., **Soheil Kolouri**, and Rajan Bhattacharyya. "System for predicting movements of an object of interest with an autoencoder." U.S. Patent 11,069,069, issued July 20, 2021.
**[Contribution 30%]**

[P8] **Soheil Kolouri**. "System and method for direct learning from raw tomographic data." U.S. Patent 11,037,030, issued June 15, 2021.
**[Contribution 100%]**

[P7] **Soheil Kolouri**, Charles E. Martin, and Heiko Hoffmann. "Machine-vision method to classify input data based on object components." U.S. Patent 11,023,789, issued June 1, 2021.
**[Contribution 40%]**

[P6] **Soheil Kolouri**, Mohammad Rostami, Kyungnam Kim, and Yuri Owechko. "Attribute aware zero shot machine vision system via joint sparse representations." U.S. Patent 10,908,616, issued February 2, 2021.
**[Contribution 40%]**

[P5] **Soheil Kolouri**, Shankar R. Rao, and Kyungnam Kim. "Zero shot machine vision system via joint sparse representations." U.S. Patent 10,755,149, issued August 25, 2020.
**[Contribution 60%]**

[P4] Martin, Charles E., Nigel D. Stepp, **Soheil Kolouri**, and Heiko Hoffmann. "Method and system for detecting change of context in video streams." U.S. Patent 10,878,276, issued December 29, 2020.
**[Contribution 20%]**

[P3] Martin, Charles E., **Soheil Kolouri**, and Heiko Hoffmann. "Method for understanding machine-learning decisions based on camera data." U.S. Patent 10,803,356, issued October 13, 2020.
**[Contribution 40%]**

[P2] **Soheil Kolouri**, Charles E. Martin, Kyungnam Kim, and Heiko Hoffmann. "Machine vision system for recognizing novel objects." U.S. Patent 10,607,111, issued March 31, 2020.
**[Contribution 40%]**

[P1] Amir M. Rahimi, **Soheil Kolouri**, and Rajan Bhattacharyya. "Explicit prediction of adversary movements with canonical correlation analysis." U.S. Patent 10,583,324, issued March 10, 2020.
**[Contribution 30%]**

## External Service

### Proposal Review Panel

NSF **Division of Mathematical Sciences (DMS)**

NSF **Division of Computing and Communication Foundations (CCF)**

NSF **Cyber Physical Systems (CPS)**

AFOSR **Complex Networks program**, *Air Force Office of Scientific Research*

### Conference/Workshop/Tutorial Organization

ICLR 2025 **International Conference on Learning Representations**
Role: Area Chair (ICLR)

EI$^2$ 2024 **Smoky Mountain Workshop on Early Developmental Intelligence and Embodied Intelligence (EI2)**
Role: Chair

MLSP 2019 **International Workshop on Machine Learning for Signal Processing (MLSP)**
Role: Session Chair

### Journal Reviewing

| | |
|---|---|
| TPAMI | IEEE Transactions on Pattern Analysis and Machine Intelligence |
| TMLR | Transactions on Machine Learning Research |
| TAI | IEEE Transactions on Artificial Intelligence |
| TIP | IEEE Transactions on Image Processing |
| PR | Pattern Recognition |
| TNNLS | IEEE Transactions on Neural Networks and Learning Systems |
| SPL | IEEE Signal Processing Letters |
| TMI | IEEE Transactions on Medical Imaging |
| ACCESS | IEEE Access |
| SIAM | SIAM Journal on Mathematics of Data Science |

### Conference Reviewing

| | |
|---|---|
| CVPR | IEEE/CVF Conference on Computer Vision and Pattern Recognition<br>2024, 2023, 2022, 2021, 2020, 2019, 2018, 2017, 2016 |
| NeurIPS | Advances in Neural Information Processing Systems<br>2024, 2023, 2022, 2021, 2020 |
| ICLR | International Conference on Learning Representations<br>2024, 2023, 2022, 2021, 2020 |
| ICML | International Conference on Machine Learning<br>2024, 2023, 2022, 2021 |
| AISTAT | International Conference on Artificial Intelligence and Statistics<br>2022 |
| AAAI | Association for the Advancement of Artificial Intelligence<br>2023,2020 |
| MIDL | Medical Imaging with Deep Learning<br>2023 |

### Tutorials and Workshops

04/2023 **IEEE International Symposium on Biomedical Imaging (ISBI)**
Tutorial: Topological Data Analysis for Biomedical Imaging Data

05/2022 **Fields Institute for Research in Mathematical Sciences**
Mini-course: Wasserstein Embeddings in Geometric Deep Learning

04/2018 **IEEE International Symposium on Biomedical Imaging (ISBI)**
Tutorial title: Optimal transport in biomedical imaging

09/2016 **IEEE International Conference on Image Processing (ICIP)**
Workshop title: Transport and other Lagrangian transforms

## University Service

### Faculty Search Committee

2022-2023 **Vanderbilt University**, *Nashville, TN*, Department of Computer Science

### Seminars & Workshops

2021- **Machine Learning Seminar Series**
Role: Founder and Organizer

### PhD Prelim Exam Committee

2024 Mingxing Rao, **Major:** Computer Science, Vanderbilt University

2022 Yuying Zhao, **Major:** Computer Science, Vanderbilt University

2022 Clayton Cohn, **Major:** Computer Science, Vanderbilt University

2021 Yu Wang, **Major:** Computer Science, Vanderbilt University

2021 Preston Robinette, **Major:** Computer Science, Vanderbilt University

2021 Noah J. Holliger, **Major:** Materials Science, Vanderbilt University

### PhD Thesis Committee

2024 Tianyuan Yao, **Major:** Computer Science, Vanderbilt University
Title: Unified Foundational Modeling for Diffusion-weighted Magnetic Resonance Imaging

2024 Yuxiang Gao, **Major:** Civil Engineering, Vanderbilt University
Title: Damage Mechanics Based Deep Learning Model Surrogates for Fracture Prediction and Inverse Design

2024 Yu Wang, **Major:** Computer Science, Vanderbilt University
Title: Data Quality-Aware Graph Machine Learning

2024 Yuying Zhao, **Major:** Computer Science, Vanderbilt University
Title: Learning Beyond Utility: Fairness, Explainability, Diversity

2024 Shiyu Wang, **Major:** Biomedical Engineering, Vanderbilt University
Title: Modeling Interactions Between Low-Frequency Physiological Processes and Functional Magnetic Resonance Imaging Data

2023 Neda Sardaripour, **Major:** Biomedical Engineering, Vanderbilt University
Title: Integrating Transcriptomic and Neuroimaging Data to Uncover Genetic Underpinnings of Human Brain Networks

2022 Xuwang Yin, **Major:** Computer Science, University of Virginia
Title: Generative Modelling with Adversarial Training

2021 Yunchao (Lance) Liu, **Major:** Computer Science, Vanderbilt University
Title: Geometric Deep Leanring in Drug Discovery

## Mentoring

### Postdoctoral/Visiting Scholars

2022- Dr. Yikun Bai

2022-2023 Dr. Ivan V. Medri

### PhD Students

2023- Chayne Thrash **Major:** Computer Science

2023- Elaheh Akbari **Major:** Computer Science

2022- Ashkan Shahbazi **Major:** Computer Science

2022- Huy Tran **Major:** Computer Science

2021- Ali Abbasi **Major:** Computer Science

2021- Xinran Liu **Major:** Computer Science

### Undergraduate Students

2023- Abihith Kothappali, **Major:** Computer Science
Notable achievements: CRA CRA Outstanding Undergraduate Researcher Award, Graduate School Travel Grant, Award Winning Poster, Data Science Institute – Summer Research Program fellowship

2022-2024 Rana Muhammad Shahroz Khan, **Major:** Computer Science
Notable achievements: CRA Outstanding Undergraduate Researcher Award (URA) - Honorable Mention
Next position: Ph.D., University of North Carolina

2022-2024 Zhanqi Zhu, **Major:** Computer Science
Notable achievements: VISE Summer Internship

2021-2023 Zihao (Harry) Wu, **Major:** Computer Science
Notable achievements: VISE Summer Internship, ICASSP publication (first author)

2021-2022 Yuzhe (Bryan) Lu, **Major:** Computer Science
Next position: M.Sc., Carnegie Mellon University

## Invited Talks

10/2024 **SIAM Mathematics of Data Science Conference (MDS24)**, *Atlanta, GA*
Title: Stereographic Spherical Sliced Wasserstein Distances

05/2024 **Smoky Mountain Workshop on Early Developmental Intelligence and Embodied Intelligence (EI2)**, *Gatlinburg, TN*
Title: A Collective of Artificially Intelligent Lifelong Learning Agents

05/2024 **Shanks Workshop 2024, Vanderbilt University**, *Nashville, TN*
Title: A Spherical Sliced Optimal Transport

05/2023 **Vanderbilt University**, *Nashville, TN*, International Conference on Approximation Theory and Beyond
Title: Optimal Partial Transport in Machine Learning

10/2022 **The University of Texas**, *San Antonio, TX*, Matrix Fall Seminar Series
Title: Lifelong Learning Machines – Approaches and Challenges

09/2022 **SIAM Mathematics of Data Science Conference (MDS22)**, *San Diego, CA*
Title: Wasserstein Embeddings in the Deep Learning Era

04/2022 **Vanderbilt University**, *Nashville, TN*, Machine Learning Seminar Series
Title: Brain-Inspired Lifelong Learning Machines

11/2021 **One World Seminar Series on the Mathematics of Machine Learning**
Title: Wasserstein Embeddings in the Deep Learning Era

11/2021 **Vanderbilt University**, *Nashville, TN*, Vanderbilt Institute for Surgery and Engineering
Title: Transport-Based Embeddings

02/2021 **University of Wisconsin-Madison**, *Madison, WI*, Department of Biostatistics and Medical Informatics
Title: Optimal Transport in Machine Learning and Computer Vision

09/2020 **University of Virginia**, *Charlottesville, VA*, ECE Department Seminar
Title: Sliced Probability Metrics for Next Generation Machine Learning

04/2019 **University of Bath**, *Bath, UK*, British Applied Mathematics Colloquium
Title: Transport-Based Transforms.

04/2019 **University of Cambridge**, *Cambridge, UK*, Department of Applied Mathematics and Theoretical Physics
Title: Optimal Transport and its Applications in Deep Learning.

02/2019 **Carnegie Mellon University**, *Pittsburgh, PA*, ECE Seminar
Title: Generalized sliced Wasserstein distances

03/2018 **Office of Naval Research (ONR)**, AI Sprint Team
Title: Multi-sensory transfer learning and domain Adaptation

04/2016 **HRL Laboratories, LLC**, *Malibu, CA*
Title: Machine Learning and Nonlinear Embeddings

01/2016 **Massachusetts Institute of Technology**, *Cambridge, MA*, Computer Science and Artificial Intelligence Laboratory (CSAIL)
Title: *Optimal Transport-Based Morphometry*