John Y. Shi

Curriculum Vitae (CV)
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Postdoctoral Researcher, Electrical and Computer Engineering, Carnegie Mellon University,
2022 - 2024 Advisor: José M.F. Moura

Education

Ph.D., Electrical and Computer Engineering, Carnegie Mellon University 2022
Thesis: A Dual Domain Approach to Graph Signal Processing Advisor: José M.F. Moura

B.S., Computer Engineering, University of Maryland, College Park 2017
B.S., Applied Mathematics, University of Maryland, College Park 2017

Publications

Journal Papers:

1. **J. Shi** and J. M. F. Moura, "GSP = DSP + Boundary Conditions – The Graph Signal Processing Companion Model" submitted to IEEE Trans. Signal Process. (2023). ArXiv: 2303.02480.
2. **J. Shi** and J. M. F. Moura, "Graph Signal Processing: Dualizing GSP Sampling in the Vertex and Spectral Domain," IEEE Trans. Signal Process. 70: 2883-2898 (2022).
3. M. Cheung, **J. Shi**, O. Wright, Y. Jiang, X. Liu, and J. M. F. Moura, "Graph Signal Processing and Deep Learning: The Role of Convolution, Pooling and Topology," IEEE Signal Process. Mag. 37(6): 139-149 (2020).

Conference Papers:

1. J. M. F. Moura and **J. Shi**, "Graph Signal Representations," accepted to *58th Asilomar Conference on Signals, Systems, and Computers* (2024).
2. **J. Shi** and J. M. F. Moura, "Graph Signal Processing: Frequency Analysis for Similar Matrices," accepted to *58th Asilomar Conference on Signals, Systems, and Computers* (2024).
3. **J. Shi** and J. M. F. Moura, "Sampling in the Graph Signal Processing Companion Model," *IEEE 13th Sensory Array and Multichannel Signal Processing Workshop (SAM)* (2024), pp. 1-5.
4. **J. Shi** and J. M. F. Moura, "Graph Signal Processing: The 2D Companion Model," *Graph Signal Processing Workshop* (2024).
5. **J. Shi**, Shreyas Chaudhari, and J. M. F. Moura, "Graph Convolutional Neural Networks in the Companion Model," *Graph Signal Processing Workshop* (2024).

6. **J. Shi** and J. M. F. Moura, “Graph Signal Processing: The 2D Companion Model,” *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* (2024), pp. 9806-9810.
7. **J. Shi**, Shreyas Chaudhari, and J. M. F. Moura, “Graph Convolutional Neural Networks in the Companion Model,” *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* (2024), pp. 7045-7049.
8. F. Abdelmoneum, **J. Shi**, and J. M. F. Moura, “Graph Classification via Simple Graph Based Features,” *57th Asilomar Conference on Signals, Systems, and Computers* (2023), pp. 583-587.
9. **J. Shi** and J. M. F. Moura, “Extending DSP to Graph Signal Processing: The Companion Approach,” *57th Asilomar Conference on Signals, Systems, and Computers* (2023), pp. 335-339.
10. **J. Shi** and J. M. F. Moura, “Graph Signal Processing: Dualizing GSP Sampling in the Vertex and Spectral Domains,” *Graph Signal Processing Workshop* (2023).
11. **J. Shi** and J. M. F. Moura, “Graph Signal Processing: Dualizing GSP Sampling in the Vertex and Spectral Domains,” *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* (2023).
12. **J. Shi** and J. M. F. Moura, “From DSP to GSP: Sampling in Both Domains,” *56th Asilomar Conference on Signals, Systems, and Computers* (2022), pp. 240-245.
13. A. Lin, W. Summer, **J. Shi**, M. Cheung, and J. M. F. Moura, “Using Sparse Spectral Shifts in Graph CNNs,” *55th Asilomar Conference on Signals, Systems, and Computers* (2021), pp. 1536-1540.
14. Y. Jiang, **J. Shi**, M. Cheung, O. Wright, and J. M. F. Moura, “Evaluating Effectiveness of Graph Structures,” *54th Asilomar Conference on Signals, Systems, and Computers* (2020), pp. 746-750.
15. **J. Shi**, W. Summer, and J. M. F. Moura, “A Dual Approach to Graph CNNs,” *54th Asilomar Conference on Signals, Systems, and Computers* (2020), pp. 1467-1471.
16. **J. Shi** and J. M. F. Moura, “Topics in Graph Signal Processing: Convolution and modulation,” *53rd Asilomar Conference on Signals, Systems, and Computers* (2019), pp. 457-461.
17. M. Cheung, **J. Shi**, O. Wright, Y. Jiang, and J. M. F. Moura, “Pooling in Graph Convolutional Neural Networks,” *53rd Asilomar Conference on Signals, Systems, and Computers* (2019), pp. 462-466.
18. M. Cheung, **J. Shi**, O. Wright, Y. Jiang, and J. M. F. Moura. “Pooling in Graph Convolutional Neural Networks,” *Graph Signal Processing Workshop* (2019).
19. **J. Shi**, M. Cheung, J. Du, and J. M. F. Moura. “Classification with Vertex-based Graph Convolutional Neural Networks,” *52nd Asilomar Conference on Signals, Systems, and Computers* (2018), pp. 752-756.
20. J. Du, **J. Shi**, S. Kar, and J. M. F. Moura, “On Graph Convolution for Graph CNNs,” *Data Science Workshop* (2018), pp. 239-243.

Teaching Experience

Tutorials:

Nov 2023: Graph Signal Processing: A Foundational Approach, *IEEE PES/IAS PowerAfrica Conference* Tutorial, Marrakech, Morocco.

Co-Instructor:

June 2023: Graph Signal Processing and Geometric Learning: A Foundational Approach, *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* short course, Rhodes, Greece.

Fall 2022: Carnegie Mellon University Course**:** 18-898D: Special Topics in Signal Processing: Graph Signal Processing and Geometric Learning, Pittsburgh, PA.

Teaching Assistant:

Carnegie Mellon University Courses:

Fall 2020: 18-202: Mathematical Foundations for Electrical Engineers

Fall 2019: 18-290: Signals and Systems

Fall 2018: 18-202: Mathematical Foundations for Electrical Engineers (Head TA)

Spring 2018: 18-290: Signals and Systems

University of Maryland – College Park Courses:

Spring 2017: Calculus II

Fall 2016: Calculus I (Ron Strauss Teaching Assistantship)

Fall 2016: ENEE140: Introduction to Programming Concepts for Engineers

Spring 2016: ENEE244: Digital Logical Design

Fall 2015: ENEE244: Digital Logic Design

Fall 2015: ENEE150: Intermediate Programming Concepts for Engineers (2 sections)

Spring 2015: ENEE150: Intermediate Programming Concepts for Engineers

Awards

June 2023: International Conference on Acoustics, Speech, and Signal Processing (ICASSP) Rising Star, Rhodes, Greece.

May 2023: Carnegie Mellon University, A.G. Jordan Award. Awarded to a single graduating ECE Ph.D. student who has combined outstanding Ph.D. thesis work with exceptional service to the ECE or CMU communities.

2017: University of Maryland – College Park, Ron Strauss Teaching Assistantship. One of only seven undergraduate students to teach Calculus.

Mentoring Experience

I have mentored and taught many students over the years. Many were Signal Processing students in 18-290, 18-491 (even when I was not a TA). I have also given career advice and support. I have also helped with their Ph.D. applications and encouraged many to apply for Ph.D.

Student Interns I have directly mentored in the Moura Lab during my PhD. (and their locations):

1. Yao (Lavender) Jiang – NYU Ph.D. student
2. Chris Liu – NYU Ph.D. student
3. Wendy Summer – Meta / Facebook Software Engineer
4. Austin Lin - Industry
5. Cynthia Fu - Industry
6. Tina Tian - Industry
7. Farida Abdelmoneum – Industry, creating her own startup

Students Advised (and their locations):

1. Vincent Luo – CalTech Ph.D., Material Science
2. Ricky Huang –Berkeley Ph.D., Operations Research
3. Xiao Jin – 5th year masters in ECE
4. Zaixing Zhang – risk management programmer at Morgan Stanley
5. Halanna Yuh – product manager at Capital One Bank
6. Zacchaeus Williams – NVIDIA hardware engineer
7. Yuxin Guo – CMU Ph.D., BioE
8. Kayla Vokt – Rice University Ph.D., BioE
9. Azaan Rehman – Deep Learning researcher at National Institutes of Health
10. Mohini Banerjee – Amazon software engineer
11. Jade Traiger – Engineer at John Hopkins Applied Physics Lab (APL)
12. Ruslana Fogler - Industry
13. Freda Su – ECE senior
14. Oi Srinualnad – Microsoft software engineer

Professional Service

Reviewer (Journal):

IEEE Trans. Signal Processing
IEEE Trans. Image Processing
IEEE Trans. Signal and Information Processing over Networks
IEEE Signal Processing Letters
IEEE Signal Processing Magazine