John Y. Shi

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SUMMARY

I am an engineer with a strong background in mathematics and programming. From teaching over ten courses, I excel at synthesizing complex ideas into actionable insights. My Ph.D. has honed my ability to collaborate, explore and solve complex/ambiguous problems, learn new concepts quickly, and think creatively—both independently and within a team. I'm excited to leverage my expertise to tackle new challenges and make a significant impact in my next role.

EDUCATION

Carnegie Mellon University   Pittsburgh, PA
Ph.D. in Electrical and Computer Engineering   *Sept 2017 - May 2023*
- **Thesis Title:** A Dual Domain Approach to Graph Signal Processing
- **Awards:** A.G. Jordan Award (Awarded to a **single** CMU graduating Ph.D. for Outstanding Thesis), ICASSP Signal Processing Rising Star (**1 out of 24** graduating Ph.D.s around the world).

University of Maryland - College Park   College Park, MD
B.S. in Computer Engineering and Applied Mathematics   *Sept. 2013 - May 2017*
- **GPA:** 3.745/4.0

EXPERIENCE

Postdoctoral Researcher   Sept 2022 – Present
Carnegie Mellon University   *Pittsburgh, PA*
- Pioneered the Companion Model, a groundbreaking framework that challenges common Signal Processing norms.
- Led GSP workshops and courses at international conferences and at Carnegie Mellon University.
- Mentored **7** undergraduate students on research projects, leading to **5** conference papers and **1** journal paper.
- Collaborated with Software Engineering Institute (SEI) researchers to obtain a grant for graph data research.

Spatial Computing Researcher, Contractor   Dec. 2024 – Present
Schemata AI   *San Francisco, CA*
- Created a ML Pipeline to automatically process scene information, reducing manual input to the LLM.
- Worked with clients to better understand their business needs and incorporate them into the Pipeline.

Software Engineering Intern   May 2017 – Aug 2017
Google   *Mountain View, CA*
- Designed and developed frontend and backend software for Google My Business – Bulk Insights, using Java and JavaScript to migrate the platform to a new framework and improve the user interface.

PROJECTS

Machine Learning on Graphs | *Python, Pytorch, MATLAB, R, Scikit-Learn*   2021 – Present
- Classified graph data, achieving 3-5% higher accuracy than deep learning methods by using decision trees.
- Showed the equivalence between popular graph deep learning architectures and traditional CNNs, achieving comparable accuracy across both models using Pytorch.
- Introduced a novel metric, edge entropy, to measure the effectiveness of graph deep learning on graph datasets.

Topology Adaptive Graph Convolutional Networks (TAGCN) | *Python, Pytorch, Java*   2018 – 2020
- Created Topology Adaptive Graph Convolutional Networks (TAGCN), which improve model accuracy by 2-3% accuracy over existing deep learning approaches on several graph datasets.
- Used Graph Signal Processing to pre-process data, increasing TAGCN accuracy by 30% on challenging datasets.
- Developed custom graphing software in Java to display TAGCN accuracy and error bars in the exact format we wanted for the Signal Processing Magazine paper.

Disaster Relief Life Vest | *Python, Arduino, OpenCV*   Spring 2018
- Engineered solutions for real-world challenges such as natural disaster recovery in other countries.
- Designed a life-vest prototype, a scale model of a flooded town, and a real-time tracking dashboard for a business pitch, all in less than 24 hours, earning third place at the CMU Impactathon.

TECHNICAL SKILLS

Languages: Java, Python, C, SQL, MATLAB, Arduino, Golang, Unix, HTML/CSS, Javascript, Ruby
Developer Tools: Git, Docker, Eclipse, VSCode, Visual Studio, IntelliJ, Microsoft Office
Libraries: Scikit-Learn, NumPy, Matplotlib, Pytorch, OpenCV

Publication List/CV Available on my website.