

# Junsheng Liu

(530)761-3243 • [junsheng@wustl.edu](mailto:junsheng@wustl.edu)

## EDUCATION

### UNIVERSITY OF WASHINGTON IN ST. LOUIS

*PhD in Computer Science*

Expected Graduation: Aug 2027

### UNIVERSITY OF SOUTH CAROLINA, COLUMBIA

*Master in Mathematics*

Graduation: Aug 2023

Cumulative GPA: **4.0**/4.0

### UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

*Bachelor of Science in Electrical Engineering with highest distinction*

Graduation: May 2021

*Bachelor of Science in Mathematics with highest distinction*

Cumulative GPA: **3.86**/4.0

## TECHNICAL SKILLS

**Programming Languages:** Python, Matlab, Mathematica, C, C++, R, LaTeX, Pytorch

## AWARDS&HONORS

The Mathematical Contest in Modeling

March 2019

- Honorable Mention

Higher Honor in Budapest Semesters in Mathematics

May 2020

Mrs E. J. Hoover Scholars

Aug 2020

Mrs E. J. Hoover Scholars

Aug 2021

Dean Fellowship at University of South Carolina

Aug 2022

CSE Scholar Award at Washington University in St. Louis

Aug 2023

## EXPERIENCE&ACTIVITIES

### Independent study on Cryptocurrency Markets May 2020-June 2021

1. Develop quantitative methods on perpetual contracts for cryptocurrency
2. Construct reinforced learning model based on tickers in equity market and technical features
3. Wrote APIs connecting data providers and own portfolio

### Independent study (Prof Ervin Gyori, Alfréd Rényi Institute of Mathematics) May 2020-June 2021

1. Find different examples on tree with 8, 16 or more vertices which are set sequential
2. Discover necessary conditions for an odd degree tree to be set sequential
3. Prove certain odd trees with some properties are set sequential with different constructing methods
4. Provide insights for all odd trees are set sequential by a pairing conjecture

### Mathematical Research (Prof Eva Czabarka, University of South Carolina, Columbia) Aug 2021-May 2023

1. Develop systems to find maximum crossing number for tanglegram via fix parameter tractable property
2. Explore the gap between the possible maximum crossing number for tanglegram of certain size

3. Prove certain types of tanglegrams can reach extreme bounds and solve the conjecture
4. Wrote and modified OCaml codes for testing

**Computer Science Research (Prof Netanel Raviv, Washington University in St. Louis) Aug 2023-**

1. Prove redundancy and rate of 2D and 3D nonlinear coding
2. Study different error-correcting codes and apply them to 2D and 3D cases

**PUBLICATIONS**

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1. Eckels, Emily N., Györi, Ervin, Liu, Junsheng and Nasir, Sohaib. "Set-Sequential Labelings of Odd Trees" *Discussiones Mathematicae Graph Theory*, <https://doi.org/10.7151/dmgt.2439>
2. Czabarka, Eva, Liu, Junsheng and Székely, Laszlo. "The gap of the tanglegram crossing number" (Submitted to *Electronic Journal of Combinatorics*)

**TEACHING & RELATED ACTIVITIES**

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1. Teaching assistant for MATH141, University of South Carolina, Columbia, 2021fall
2. Teaching assistant for MATH142, University of South Carolina, Columbia, 2022spring
3. Maintenance and development of math placement test for all students, University of South Carolina, Columbia, 2022-2023