JUSTIN PAYAN

WEBPAGE: https://justinpayan.github.io

jpayan@andrew.cmu.edu ◇ (+1) 770-876-0239 ◇

LinkedIn ◇ Github ◇ Google Scholar

Academic Positions

Carnegie Mellon University, Oct '24 - Sept '25
Postdoctoral Research Associate with Nihar Shah Pittsburgh, PA

- Optimizing telescope scheduling at the Atacama Large Millimeter/submillimeter Array, under stochastic conditions
- Applying large language models to improving peer review

Research Interests

I solve problems of social importance using techniques from operations research, data science, machine learning, and natural language processing.

Combinatorial Optimization, Machine Learning, Natural Language Processing

Education

University of Massachusetts Amherst Sept '18 - February '25
PhD Computer Science
(advised by *Yair Zick*)

University of Georgia Sept '13 - May '18
M.S. Artificial Intelligence, B.S. Mathematics, A.B. Cognitive Science
(advised by *Frederick Maier*)

Industry Experience

Adobe Research, Document Intelligence Lab May - August '23
Research Intern under Chris Tensmeyer College Park, MD

- Document structure inference using deep learning, computer vision, and combinatorial optimization

Microsoft, Calc Intelligence June - September '22
Data Science Intern under Kartik Sridhar Redmond, WA

- Data augmentation using GPT-3 for an NL to code task
- Worked closely with both production and research teams to implement state-of-the-art modeling and evaluation

Amazon Alexa, Trustworthy Alexa June - September '21
Research Intern under Yuval Merhav Cambridge, MA (remote)

- Applied generative insertion transformers (GIT) to data augmentation for NER
- Investigated interaction of GIT augmentation with knowledge-based augmentation approaches

Amazon Alexa, Trustworthy Alexa May - August '20
Research Intern under Yuval Merhav Cambridge, MA (remote)

- Explored the efficacy of generative replay for continual learning in a privacy-aware setting
- Created and released dataset for evaluating continual learning for single-task NER

Vertica, Machine Learning — June '17 - June '18
Software Engineer under Vincent Xu — Cambridge, MA

- Implemented distributed machine learning algorithms in SQL and C++, including k-means++
- Designed, built, and maintained data preprocessing functions, such as one-hot encoding, normalization, and missing value imputation

Publications

$(\alpha - \beta)$ indicates alphabetical order; asterisks indicate equal contribution.

1. Who You Gonna Call? Optimizing and Verifying Predictive Expert Assignments
   Cyrus Cousins, Sheshera Mysore, Neha Nayak Kennard, **Justin Payan**, and Yair Zick $(\alpha - \beta)$
   In Progress

2. Fair and Welfare-Efficient Constrained Multi-matchings under Uncertainty
   Elita Lobo*, **Justin Payan***, Cyrus Cousins, and Yair Zick
   NeurIPS 2024

3. InstructExcel: A Benchmark for Natural Language Instruction in Excel
   Justin Payan, Swaroop Mishra, Mukul Singh, Carina Negreanu, Christian Poelitz, Chitta Baral, Subhro Roy, Rasika Chakravarthy, Benjamin Van Durme, and Elnaz Nouri
   EMNLP 2023 (Findings)

4. Into the Unknown: Assigning Reviewers to Papers with Uncertain Affinities
   Cyrus Cousins, **Justin Payan**, and Yair Zick $(\alpha - \beta)$
   SAGT 2023

5. Graphical House Allocation
   Hadi Hosseini, **Justin Payan**, Rik Sengupta, Rohit Vaish, and Vignesh Viswanathan $(\alpha - \beta)$
   AAMAS 2023

6. Relaxations of Envy-Freeness over Graphs
   Justin Payan, Rik Sengupta, and Vignesh Viswanathan $(\alpha - \beta)$
   AAMAS 2023 (Extended Abstract)

7. I Will Have Order! Optimizing Orders for Fair Reviewer Assignment
   Justin Payan and Yair Zick
   IJCAI 2022

8. Towards Realistic Single-Task Continuous Learning Research for NER
   Justin Payan, Yuval Merhav, He Xie, Satyapriya Krishna, Anil Ramakrishna, Mukund Sridhar, and Rahul Gupta
   EMNLP 2021 (Findings)

9. Online Post-Processing in Rankings for Fair Utility Maximization
   Ananya Gupta*, Eric Johnson*, **Justin Payan**, Aditya Roy, Ari Kobren, Swetasudha Panda,

Michael Wick, and Jean-Baptiste Tristan
WSDM 2021

10. Document Representations using Fine-Grained Topics
Justin Payan, Nicholas Monath, and Andrew McCallum
Sets & Partitions Workshop at NeurIPS 2019

Code Contributions

OpenReview 2022
Created and deployed the FairSequence reviewer matching algorithm on OpenReview platform

Awards & Scholarships

- University of Georgia Foundation Fellowship (2013-2017)
$128,260$ in tuition and stipend for housing, research, and travel

Invited Talks

- Brown University (E-GLAMOR Group), March 2023
Harvard University (EconCS Seminar), January 2023
Carnegie Mellon University (Nihar Shah's Group), November 2022
(Into the Unknown: Assigning Reviewers to Papers with Uncertain Affinities)
- UMass Data Analytics and Computational Social Science Brownbag Series, April 2021
(Envy-Freeness in Paper Reviewer Assignment)
- UMass Amherst Theory Seminar, April 2021
(Fair Reviewer Assignment)

Academic Service

- **Workflow Chair** for IJCAI 2023
- **Workshop Co-organizer** for Computational Fair Division at IJCAI 2023 and 2024, Practical Improvements to Peer Review at AAMAS 2025
- **Program Committee / Reviewer** for ACL 2023, EC 2025
- **Subreviewer** for NeurIPS 2024, EC 2024, AAMAS 2022, GAIW at AAMAS 2022

Teaching / Mentoring / Other Service

- **Instructor of Record** at UMass Amherst for *Intro to Numerical Computing with Python* (Fall 2020 & 2021)
- **Graduate Teaching Assistant** at UMass Amherst for *Intro to AI* (Fall 2018), *Intro to Problem Solving with Computers* (Fall 2020), and *Advanced Algorithms* (Spring 2021)
- **Graduate Mentor** for UMass Undergraduate Sloan Scholar (2023-2024)
- **Co-mentored** MS student on Searching for Fair Allocations (2021-2022)

- **Graduate Mentor** for UMass Undergraduate Research Volunteer Program (January 2021, June - July 2021)

Skills

Python, Gurobi, CVXPY, linear programming, integer programming, combinatorial optimization, machine learning, named entity recognition, large language models, Pandas, Numpy, Scikit-learn, Pytorch