



Jiaru (Rubin) Zou

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EDUCATION

University of Illinois at Urbana-Champaign (UIUC) Bachelor of Science in Computer Engineering, Minor in Mathematics & Statistic. GPA: 3.97/4.00	Champaign, IL August 2020 - May 2024
Zhejiang University ZJU-UIUC Study Abroad Program. GPA: 4.00/4.00	Hangzhou, China August 2020 - May 2021

RESEARCH EXPERIENCE

Senior Project and Thesis Hybrid
Undergraduate Researcher, Advised by Prof. Jiawei Han August 2023-present

- Conducted an automatic supervision generation technique to facilitate zero-shot learning in text classification tasks.
- Formulated the technique and produce top-tier training data using LLM's label-descriptive prompt to enhance more intricate NLP tasks' performance including reasoning tasks, text summarization, and question answering.

Contextual Multi-armed Bandit and Meta-Learning Algorithm Design – UIUC iSAIL Lab Champaign, IL
Research Group Member, Advised by Prof. Jingrui He March 2022-Present

- Designed and developed a novel framework BASS to enhance task scheduling strategies by leveraging meta-model status. Addressed data scarcity issues during the initial stages of meta-training and laid the groundwork for subsequent meta-training iterations. Conducted coding experiments and ablation studies on the proposed framework.
- Drafted a research publication on an innovative framework that combines exploration-exploitation strategy in neural bandits with graph-derived insights to tackle dynamic personalized PageRank problems.

Mathematical Language Processing – UIUC MLP Group Champaign, IL
Research Group Member, Advised by Prof. Kani Nickvash August 2022-May 2023

- Addressed mathematical token extraction by developing a novel dataset called MTDE from the ArXiv corpus. Conducted evaluations of dataset effectiveness by introducing new NLP tasks, encompassing single and multi-word descriptor extraction. Experimented with leading models such as GPT3 to assess their performance on the new dataset.
- Enhanced the self-designed dataset by augmenting it with additional mathematical tokens accompanied by context descriptions. Implemented an automated parsing system to extract and correlate mathematical variable definitions with existing math descriptors from diverse data sources.
- Presented findings at a prestigious conference, showcasing the enhanced MTDE dataset's value for advanced classification tasks. Emphasized mathematical token attributes and properties, with the overarching goal of augmenting NLP models' classification capabilities in STEM domains.

Deep Learning Model quantization – NCSA, Center for Artificial Intelligence Innovation Champaign, IL
Research Assistant, Advised by Prof. Volodymyr Kindratenko January 2022-May 2023

- Applied pruning and quantization techniques to enhance efficiency and performance in convolutional neural networks.
- Deployed quantized neural networks onto Field Programmable Gate Arrays (FPGAs), achieving hardware-level compilation and performance acceleration. Introduced a novel framework that integrates post-training quantization with vision transformer models, yielding superlative model performance. Deployed the framework on the high-speed processor expansion bus (OpenCAPI), achieving a threefold increase in FPGA-based acceleration, highlighting its substantial computational prowess.
- Conducted extensive experiments, showing a 20x reduction in memory consumption, a 2.5x boost in training speed, and an 89% accuracy for image classification tasks.

INTERNSHIP EXPERIENCE

Microsoft Research – NLP and ML Research Intern Beijing, China; August 2023-present

- Developed a data insights and analysis library for Microsoft Excel, focusing on L2 analysis problem-solving and enabling LLM insights learning. Created a semantic API (copilot) integrated with GPT-4 to enhance semantic granularity in analysis while ensuring both human and LLM usability.
- Pioneered the concept of a unified processor called "Table Provider" for streamlined tabular reasoning tasks.
- Innovated and optimized tabular input through packing, sampling, and augmentation techniques. Enhanced LLM performance in structured data comprehension and concluded the achievement in a research publication.

Yummy Future - Software and Robotics Engineer Intern Champaign, IL; May 2023-August 2023

- Built a robotics system for automated coffee service, utilizing a combination of Arduino, Raspberry Pi, and the MG400 robot.
- Devised TCP, Serial Service, and MQTT communication protocols to facilitate seamless interaction among system components. Orchestrated the deployment of a Firestore cloud command center for comprehensive and automated system control.
- Established and maintained the sustainability of the robotics system by implementing Pytest on the Raspberry Pi and integrating it with the cloud command center, guaranteeing reliable and consistent operation performance.
- Led the development of an Arduino2560 automated test system, focusing on the intersection of software and hardware elements, including the Cup/ICE dispenser and rail modules.

IntelliPro Group Inc. - Software Development Engineer Intern Santa Clara, CA; June 2022-August 2022

- Constructed the backend of a B2B sales intelligence and email campaign platform.
- Developed essential endpoint features, including A/B testing and conditional filters. Enhanced user experiences through product

- lifecycle design. Implemented a recommendation system based on the KNN-algorithm for relevant product recommendations.
- Implemented a comprehensive dataset containing customer information. Leveraged Scrapy and SQL to optimize data collection and management, resulting in improved sustainability and performance of the company's software APP.

UIUC Disruption Lab - Software Engineer Intern

Champaign, IL; August 2022-May 2023

OSF Health Care

- Collaborated with OSF HealthCare to enhance patient data privacy and control using Solidity-based smart contracts. Empowered patients by granting them complete control over data access and delivering query results securely and privately.
- Deployed the Oasis Sapphire smart contract backend to safeguard patient data and ensure privacy.
- Developed a user-friendly React-based website, enabling users and administrators to manage their data securely via MetaMask registration. Expanded website functionality by implementing notifications and researcher portals, enhancing the governance system to improve user experience and data management.

Greenwashing

- Implemented Natural Language Processing (NLP) and data mining tools for the systematic collection, interpretation, and analysis of sustainability data. Presented real-time global sustainability insights for informative visualization.
- Leveraged transfer learning models to enable highly accurate contextual searches within worldwide companies' ESG reports. Engineered prompts to extract structured data from reports and integrated it with OpenAI to generate a MongoDB Database.

Tencent – Product Management Intern

Beijing, China; August 2022-May 2023

- Facilitated a dynamic collaboration between Tencent and BOE (Beijing Over East), driving forward an authentication and manufacturing initiative within the co-working project valued at over two million dollars.
- Demonstrated strong project management skills by efficiently planning, expediting, and hosting multiple conferences, notably the Info-Comm China 2021 event.
- Conducted comprehensive research and analysis of the digital online meeting sector, including an assessment of the company's current market position, showcasing expertise in market evaluation and technical strategic planning.

SKILLS

- Programming Languages: C/C++, Python, Java/Java Spring, x86, Solidity, Go, System Verilog, R, TypeScript, SQL.
- Techniques: PyTorch, NumPy, TensorFlow, Meta-Learning, RL, NLP, contextual bandits, LLM, Quantization, OOP, AWS.

PUBLICATIONS

Manuscripts and Pre-prints

- Incoming Paper 1 on Personalized PageRank Bandits in contextual bandits.
- Incoming Paper 2 on Table Provider in tabular reasoning.

Peer-reviewed Conference

- Meta-Learning with Neural Bandit Scheduler

NeurIPS 2023

Yunzhe Qi, Yikun Ban, Tianxin Wei, Jiaru Zou, Huaxiu Yao, Jingrui He

COMMUNITY SERVICES

Academic:

- ICML: program committee paper reviewer

2023
- NeurIPS: program committee paper reviewer

2023
- ICDE: program committee paper reviewer

2022

School & RSO:

- Chinese Engineering Student Association: Technology Department member

2022
- Illinois Solar Car: electronic team member

2021
- Course Assistant and grader of ECE210, ECE310, ECE313, CS374

2021-2023
- Chinese Student & Scholar Esports Association: Vice President

2021-2022
- Overseas China Education Foundation (OCEF): Student Tutor, team member

2020-2022
- Chinese Union - Illinois Chinese Student Organization: minister of the public relation

2020-2022

HONORS AND AWARDS

- Microsoft Stars of Tomorrow Award

2023
- O. Thomas and Martha S. Purl Scholarship

2023
- Professor N. Narayana Rao Scholarship

2023
- Daniel W. and Carol A. Dobberpuhl Student Award

2023
- Innovation Program Certificate

2023
- Illinois Engineering Achievement Scholarship

2022
- Illinois Engineering Outstanding Scholarship

2022
- UIUC Dean's List

All semesters
- UIUC, Edmund J. James Scholarship

2021-2023
- International Concrete Dragon Boat Competition (ICDBC), Second Prize and Best Design Prize.

2020