JIARUI LIU

(413) · 659 · 6088 ◇ jiaruil@umass.edu

Homepage: `https:jrliu.icu`

EDUCATION

University of Massachusetts Amherst *Sept 2024 - May 2025*

(4+1 Accelerated) Master in Computer Science;

Overall GPA: not available yet

University of Massachusetts Amherst *Sept 2019 - May 2024*

B.S. in Computer Science and Math;

Degree Honor; Honor thesis with Mohit Iyyer at UMass NLP

Overall GPA: 3.96/4.0

Highlight coursework: Semantics, Introduction to Transformational Grammar, Formal Language Theory, real analysis

UNPUBLISHED RESEARCH WORK

Multi-lingual one-shot Font Generation with Vision Transformer *Oct 2024 - Dec 2024*

Computer Vision and inforamtion retrieval Semester Project *UMass Amherst*

· Developed a bi-encoder-like ViT-based model for multi-lingual font style transfer task.

· Leveraged MAE pre-training and retrieval augmentation to enhance the model, enabling it to produce high-quality outputs in a one-shot setting, even for unseen fonts, unknown characters, and made-up characters.

· Achieved results comparable to prior work without requiring a base font or fine-tuning on parallel data, improving generalizability and usability.

Translate of literature using LLMs with external knowledge *Sept 2023 - May 2024*

Undergraduate Honor Thesis *UMass NLP group*

· Conducted honor thesis research under the guidance of Professors *Mohit Iyyer* and *Marzena Karpinski*

· Focused on enhancing the translation consistency by in-context learning and Retrieval Augmented Generation.

· Generated a named-entity table insertion method for LLM, achieved a **48.6%** increasement in terminology consistency and improving overall translation quality by 2%.

· Implemented the method within an efficient translation pipeline, demonstrating potential for improved context utilization and domain adaptation in literary translation tasks.

Bert-based context-aware Chinese Synonyms recommendation system *July 2023 - August 2023*

Research Intern at Chovix Inc. *Suzhou, China*

· Built the first context-aware Chinese synonym dataset.

· Design a lightweight context-aware BERT-based model for Chinese synonym substitution task.

· Resolved polysemy and out-of-vocabulary issues in previous dictionary-based method and matched GPT-3-level performance in production.

RESEARCH AND INTERNSHIP EXPERIENCE

Independent Study: Formal Verification *Feb 2023 - May 2023*

Manning College of Information and Computer Science *Amherst, MA*

· Study and research of formal verification and Coq with professor Marius Minea.

· Research on theorem proving and interactive theorem provers that enable the mechanical construction of formal proofs

· Conducted formalization and verification of the Pumping lemma for regular languages in Coq

Quality Assurance Intern, Baidu   May 2021 - Aug 2021
Baidu Inc.   *Beijing, China*

· Tested PHP and Golang server modules of live streaming system as a software tester intern.
· Analyzed requirements, planned test cases, developed test feedback and ensured that the code was bug-free and accurate
· Fulfilled three server-side release requirements and one client-side requirement during teamwork in DevOps and Agile development environment
· Independently tested the Live Broadcast Assistant on Windows and fulfilled two major requirements on the server's side
· Configured and deployed complex test environment of a living stream server

PROJECTS

Descartes's Perspective on Modern Machines and Thinking   Spring 2024
Final writing of Philosophy History   *UMass Amherst*

· Clarified Descartes's definitions of machine and think and analyzed Descartes's arguments on why machines cannot think, examining their applicability to modern machines.
· Addressed potential objections, and illustrated the essential role of the mind in Descartes's conception of thinking.
· Argued that Descartes would still maintain that machines lack the crucial component of the mind, and thus cannot think in the same way as humans.

Lay Summarization for Biomedical Scientific Journals   Spring 2023
Final project of course: advanced NLP   *UMass Amherst*

· Research on abstractive scientific lay summarization with 3 other group members.
· Construct new method that combines PEGASUS and Presumm for better lay summarization of biology & medicine Journals, and using advanced evaluation matrices like COMET to benchmark our work.

A modified PageRank algorithm that identifies a specific group of users in the online forum   Dec 2022
Final presentation for honors colloquia: introduce to algorithm   *UMass Amherst*

· Analyzed user behaviors and Formulated additional factors influencing users' rank and proposed a Modified PageRank algorithm that can highlight target users' overall rank.
· Evaluated the algorithm with datasets from 2 online forums and found notable improvement compared with the previous baseline algorithm.

SERVICE

Teaching Assistant, Data Structures Course   Fall 2024
UMass CICS 210 Data Structures   *UMass Amherst*

AWARDS & HONORS

Bay State Fellowship	Fall2024
Dean's List	Fall2019 - Spring2024
Chancellor's Award	Fall2019

LANGUAGES

Natural Language	Chinese (native), Japanese (N2 level)
Imperative	C, C++, Java
Functional	Haskell, JavaScript
Scripting	Python, JavaScript, Bash
Verification	Coq
Other	LaTeX, HTML/CSS, SQL