Yi-Chun (Rimi) Chen, Ph.D.

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Summary

Experiences — Motivated and self-directed professional with a demonstrated record in conducting and disseminating AI and ML research findings. Skilled in designing and optimizing models to align with research objectives, yielding impactful outcomes. Collaborated closely with faculty and students to consistently excel in research-related tasks. Proficient in Python, PyTorch, Transformer, OpenCV, and ML frameworks.

Research Fields — Multimodal Understanding, Machine Learning, Computer Vision, Visual Narrative, Generative AI.

Research Interests

Topics — Human-AI Collaboration, Visual Narrative Comprehension and Generation, Multimodal Understanding, Procedural Content Generation.

Education

2015 – 2023 — **Ph.D., Computer Science, North Carolina State University (NCSU), Raleigh, NC, US** GPA: 3.56/4.0

2011 – 2013 — **M.S., Computer Science, National Tsing Hua University (NTHU), Hsinchu, Taiwan**. GPA: 4.17/4.3

2007 – 2011 — **B.S., Computer Science, National Tsing Hua University (NTHU), Hsinchu, Taiwan** GPA: 3.46/4.3

Skills

Languages — Strong reading, writing, and speaking competencies in English and Mandarin Chinese.

Coding — Python, Java, C/C++, PyTorch, Transformer, Langchain, LLM, Scikit-learn, OpenCV, Matlab, OpenGL.

Others — PyGame, Kivy, Unity, Linux.

Web Dev — Html, css, JavaScript.

Misc. — Academic research, Collaboration, Problem-solving, Analytical Thinking, Attention to Detail, Interdisciplinary research.

Research Experiences

2025 May – · · · · **Postdoctoral Associate at Data-mining Lab** Yale University, New Haven CT, US.
Focus: Multimodal AI for medical narratives and interactive patient-provider communication

2023 – 2024 **Research Scholar at ARNAV Lab,** North Carolina State University, Raleigh NC, US.
Focus: Multimodal understanding and content generation

- Led research plans in Generative AI, contributing to human-AI collaborations.
- Developed interactive tools for integrating AI content generation with creativity.
- Constructed knowledge representations of images for AI comprehension.
- Generated interactive scenes based on information using advanced multimodal AI techniques to support narrative-rich content generation.

2015 – 2023 **Graduate Research Assistant,** North Carolina State University, Raleigh NC, US.
Focus: Visual narrative comprehension and generation

- Conducted in-depth research on computational models for narrative understanding, improving content inferring accuracy.
- Published scientific papers of machine-learning models for narrative analysis.
- Developed a cognitive simulation framework leveraging layered learning models, enhancing understanding of human narrative.
- Researched a frame transition labeling model for comic analysis with Neural networks, analyzing differences among genres.
- Designed and implemented a system to generate image sequences through adjustable authoring layers, contributing to customizable content.

2014 – 2015 **Research Assistant.** Institute of Information Science—Academia Sinica, Taipei, Taiwan.
Focus: Software engineering and data processing

- Conducted code reviews and developed software components for data systems, improving disaster data efficiency.
- Designed a distributed, event-triggered, Intelligent Active Storage Service (IASS).

2011 – 2013 **Student Researcher at AI Lab.** National Tsing Hua University, Hsinchu, Taiwan.
Focus: Multi-agent system and machine learning

- Enhanced multi-agent reinforcement learning, achieving faster convergence.
- Designed task allocation protocols for power restoration in self-adaptive multi-agent systems, contributing to efficient solutions.

Publications

Under Review

1 **Y.-C. Chen**, "Hierarchical event modeling for visual narratives: A case study on comics," Submitted to ACM International Conference on Multimedia 2025 (ACMMM), 2025.

2. **Y.-C. Chen**, "Robust symbolic reasoning for visual narratives via hierarchical and semantically-normalized knowledge graphs," Submitted to 27th European Conference on Artificial Intelligence 2025 (ECAI), 2025.
3. **Y.-C. Chen** and A. Jhala, "A multi-modal approach to style transfer in comics with narrative comprehension," Submitted to ACM International Conference on Multimedia 2025 (ACMMM), 2025.

Conference Proceedings

1. **Y.-C. Chen** and A. Jhala, "Collaborative comic generation: Integrating visual narrative theories with ai models for enhanced creativity," in *Proceedings of International Workshop on Artificial Intelligence and Creativity (CREAI2024@ ECAI)*, 2024. URL: https://arxiv.org/abs/2409.17263.
2. **Y.-C. Chen** and A. Jhala, "A computational model of comprehension in manga style visual narratives," in *Proceedings of the Annual Meeting of the Cognitive Science Society*, vol. 43, 2021. URL: https://escholarship.org/uc/item/0cn1n4k7.
3. **Y.-C. Chen**, J. Robertson, and A. Jhala, "Abstractions for narrative comprehension tasks.," in *INT/WICED@ AIIDE*, 2018. URL: https://ceur-ws.org/Vol-2321/paper5.pdf.
4. Y.-W. Huang, **Y.-C. Chen**, W.-Y. Yu, and V.-W. Soo, "Stochastic negotiation with market utility for automated power restoration on a smart grid," in *Third International Workshop in Agent Technologies for Energy Systems*, 2012. URL: https://web-archive.southampton.ac.uk/www.ates2012.org/papers/paper4.pdf.

Journal Articles & Preprints

1. **Y.-C. Chen** and A. Jhala, "A customizable generator for comic-style visual narrative," *arXiv preprint arXiv:2401.02863*, 2023. URL: https://doi.org/10.48550/arXiv.2401.02863.
2. **Y.-C. Chen** and A. Jhala, "Cpst: Comprehension-preserving style transfer for multi-modal narratives," *arXiv preprint arXiv:2312.08695*, 2023. URL: https://doi.org/10.48550/arXiv.2312.08695.
3. **Y.-C. Chen** and A. Jhala, "Panel transitions for genre analysis in visual narratives," *arXiv preprint arXiv:2312.08720*, 2023. URL: https://doi.org/10.48550/arXiv.2312.08720.
4. F. Freitas, T. Berreth, **Y.-C. Chen**, and A. Jhala, "Characterizing the perception of urban spaces from visual analytics of street-level imagery," *Ai & Society*, vol. 38, no. 4, pp. 1361–1371, 2023. URL: https://doi.org/10.1007/s00146-022-01592-y.

Thesis

1. **Y.-C. Chen**, "A framework with hierarchical models for visual narrative sequence comprehension and its applications," Ph.D. dissertation, 2023. URL: https://search.proquest.com/openview/c1be29fbfe5243f948955265f99a0276/1?pq-origsite=gscholar&cbl=18750&diss=y.
2. **Y.-C. Chen**, "Oracle learning for agent negotiation based on rationality in task allocation problem," M.S. thesis, 2013. URL: https://www.airitilibrary.com/Article/Detail/U0016-2511201311365839.

Selected Projects

Projects

2024 **Collaborative Comic Generation**.
https://github.com/RimiChen/2024-Comic-Assistant

- Explored how human creativity and generative AI collaborate on comic generation.
- Designed and implemented a narrative theory-driven authoring tool for generating image sequences with content planning.

GameTileNet: Game Material Dataset with Semantic Context.
https://github.com/RimiChen/2024-GameTileNet

- Researched how semantic mapping between visual elements and narrative benefits narrative-rich procedural content generation.
- Provided a dataset of game materials with semantic and affordance annotations by employing vision and language models.
- Analyzed the challenge of upscaling and object detection for low-resolution images.
- Leveraged advanced prompt engineering techniques to interact with a Large Language Model (LLM), demonstrating proficiency for specific research objectives.
- Developed prompts to extract key time frames from generated narratives, enhancing the ability to analyze and structure story progression.

Situation Model for Events in Image Sequences.

- Developed a situation model with a knowledge graph of an image sequence to capture the narrative of image sequences.
- Applied diversity of vision and language models encoding features of comics to represent the context of image sequences.
- Designed and researched computational models of visual narrative understanding.

Grant Involvement

2025 **Yale AI Seed Grant Proposal (PI: Dr. Samah Jarad-Fodeh), submitted 2025.**
Project: "GoalViz: A Generative AI Framework for Adaptive, Goal-Driven Narrative Health Education"
Role: Project Architect and Technical Lead (Postdoctoral Associate)

- Conceived the research idea and developed the full proposal draft, including the scenario design, technical architecture, evaluation metrics, and project timeline.
- Led the integration of generative AI techniques (LLMs, VLMs, symbolic narrative modeling) into a cohesive pipeline tailored to patient-defined goals.
- Coordinated all documentation and collaborative input for submission, including team narrative, budget planning, and methodology.
- Designed the project's methodological innovation with emphasis on human-centered, adaptive learning experiences in healthcare.

Teaching Experiences

2015 – 2023 **Graduate Teaching Assistant.**

- Assisted in teaching and grading for courses in Game Design and Interactive-related subjects:
  - CSC 281 Foundations of Interactive Game Design
  - CSC 481/581 Game Engine Foundations
  - CSC 230 C and Software Tools
- Led workshop sessions, held office hours, and supported student learning in interactive computing and programming foundations.

Miscellaneous Experience

Awards and Achievements

2010 **Overall Winner**, Student Cluster Competition in Supercomputing 2010 (SC10). Optimized hyperparameters for scientific applications on a Linux-based high-performance computing cluster, enhancing overall computational efficiency.

Professional Services

2024-2025 **Program Committee Member**. CREAI2024@ECAI, IJCAI2025, ECAI2025
Reviewer. CogSci2024, CogSci2025, ACMMM2025
Invited Talk: Artificial Intelligence for Visual Narrative Comprehension and Generation

- (March 7, 2025) Chung Cheng Institute of Technology National Defense University

Presentations:

- (June 6, 2025) Poster Presentation, 2025 Yale Postdoctoral Symposium — "Hierarchical Event Modeling for Multimodal Narrative Comprehension," Yale University.

2011 **Student Volunteer**. AAMAS2011

References

Dr. Arnav Jhala
Associate Professor
Ph.D. Advisor
North Carolina State University, Computer Science
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Dr. Julio Bahamon
Associate Teaching Professor
Course Instructor — Teaching Assistant (2015–2016)
UNC at Charlotte, College of Computing and Informatics
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Dr. Alexander Card
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Dr. Ignacio Domínguez
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