YUKUAN LU

https://lyk-love.cn · lykuni@ucdavis.edu · Kemper Hall RM. 2221, Davis, CA 95616

Research Interest

I am working on deep unsupervised learning, specifically world models. My core beliefs include:

- The scaling law holds promise, whereas incorporating prior knowledge is not a sustainable approach (refer to The Better Lessons).
- The generality of AI models comes from data compression.
- Efficient and effective reinforcement learning is facilitated by learning in a latent space.

I am intrigued by the following questions:

- Can we capture the structure of the image signal space?
- Given that data compression entails information loss, how can we identify and preserve **important** signals in their original spaces?
- More generally, what constitutes a **good** representation?

Keywords: Unsupervised (self-supervised) representation learning, world models, generative models

Education

M.S. in Electrical and Computer Engineering, UC Davis Expected June. 2025

- Advisor: Professor Yubei Chen
- Thesis: *Integrating reward signals into World Models Learning*

B.E. in Software Engineering, Nanjing University, Nanjing June. 2023

- Advisor: Professor Minxue Pan
- Thesis: *A comment clone detection method based on comment classification*

Publications

Integrating reward signals into World Models Learning Sept. 2023 – Present

Advisor: Professor Yubei Chen

- Integrated the reward signals into the world model learning phase to reduce the information loss of the important image signals.
- Leveraged generative and contrastive learning methods into world models, along with state space model architecture.

Projects

Collaborative Crowdsourcing Test Platform June. 2022 – Sep. 2022

Team Leader, Architect, Backend Developer Kubernetes, Docker, Jenkins, Java, SQL

- Created a crowdsourcing test platform where tasks are submitted, distributed and collaborated on.
- Constructed a full CICD workflow using Jenkins. Integrated it with Github and Gitlab using webhook.
- Implemented a cloud-native architecture. Using docker as containerization technology, kubernetes as orchestrators. For poor hardware performance environments, used dockerswarm as an alternative.

Skills

- Programming: Python, Java
- Technologies and Framework: Pytorch, Jax, Git, Linux Shell, Docker, Jenkins, Kubernetes