Po-Chen Ko

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Education

National Taiwan University   Taipei, Taiwan
Bachelor of Science in Engineering, Electrical Engineering (EE)   *Sep. 2020 - Aug. 2024*
GPA: 4.08/4.3
Relevant Courses: Machine Learning, Computer Vision, Applied Deep Learning.

Research

Learning To Act From Actionless Videos Through Dense Correspondences
Po-Chen Ko, Jiayuan Mao, Yilun Du, Shao-Hua Sun, Joshua B. Tenenbaum
ICLR 2024 **(Spotlight)**
📄 *paper* 🌐 *project page* ⃝ *Code*

Context-Aware Replanning with Pre-Explored Semantic Map for Object Navigation
Po-Chen Ko*, Hung-Ting Su*, Ching-Yuan Chen*, Jia-Fong Yeh, Min Sun, Winston H. Hsu
CoRL 2024
📄 *paper* 🌐 *project page* ⃝ *Code*

Implicit State Estimation via Video Replanning
Po-Chen Ko, Jiayuan Mao, Yu-Hsiang Fu, Hsien-Jeng Yeh, Chu-Rong Chen, Wei-Chiu Ma, Yilun Du, Shao-Hua Sun
ICML Workshop on Building Physically Plausible World Models 2025 **(Best paper)**, Under Submission
📄 *paper* 🌐 *project page* ⃝ *Code*

Learning Skills from Action-free Videos
Hung-Chieh Fang*, Kuo-Han Hung*, Chu-Rong Chen, Po-Jung Chou, Chun-Kai Yang, **Po-Chen Ko,** *et al.*
ICML Workshop on Building Physically Plausible World Models 2025, Under Submission
📄 *paper*

Experience & Internship

Computer Science and Artificial Intelligence Laboratory (CSAIL), MIT   Cambridge, MA
Visiting Student @ cocosci group advised by Prof. **Joshua B. Tenenbaum**   *Feb. 2023 - Aug. 2023*
Led the Development of a framework that trains an RGB observation conditioned diffusion model as a planner and recovers robot actions from predicted videos through dense correspondences.

Robot Learning Lab (RLL), NTU Taipei, Taiwan   Taipei, Taiwan
Undergerduate Researcher advised by Prof. **Shao-Hua Sun**   *Feb. 2022 - Apr. 2025*
Research Assistant advised by Prof. **Shao-Hua Sun**   *Sep. 2022 - Present*
Worked on RL and programmatic agents. Explored controlling the behavior of multi-task agents by exploiting multi-dimensional reward function.

Communication and Multimedia Lab (CMLab), NTU   Taipei, Taiwan
Undergerduate Researcher @ MiRA group advised by Prof. **Winston Hsu**   *Feb. 2024 - Apr. 2025*
Improved VLM-based semantic maps for Object Navigation by leveraging uncertainty information from the map to aid candidate selection.

Awards & Achievements

Travel Grant Recipient — CoRL 2024   *Oct. 2024*

1st Place / Department-wide — NTUEE Undergraduate Innovation Award   *Jun. 2024*
Departmental prize for undergraduate research project

200+ GitHub stars — AVDC open-source video-planner training library   *Oct. 2023*

1st Place / 1170 participants — ML2021Spring Speaker Classification Competition   *Jun. 2021*

Projects

Coordinate-ResNet: Inductive Bias for Vision Backbones. ○ *Code*   *Dec. 2023*
- Integrated a coordinate-based inductive bias into a ResNet backbone, enhancing spatial awareness in vision tasks.
- Evaluated on spatially-rich target tasks and demonstrated significantly improved performance through learned coordinate features and architecture augmentation.

User Preference Prediction System. 🗎 *slides*   *Jan. 2023*
- Built a preference-prediction pipeline using augmented user data, text embeddings (mT5, text2vec), and multi-head attention, exploring seq2seq and top-K classification models.
- Improved unseen-course prediction through course-similarity modeling (CoSENT) and k-NN score adjustment, yielding consistent gains on validation and test sets.

Hexapod Trajectory Planning with Actor–Critic Learning. 🗎 *slides*   *Oct. 2022*
- Designed a trajectory-planning system for a hexapod robot using an Actor–Critic framework, where the critic learned terrain-aware value estimates from simulation data and the actor exploited them to refine motion trajectories.
- Improved gait stability and path efficiency by integrating learned value functions with classical trajectory heuristics, achieving smoother and more reliable locomotion in simulation.

Pupil Tracking with Semantic Segmentation and Confidence Estimation. 🗎 *report*   *Jun. 2022*
- Designed a lightweight autoencoder with 5-frame temporal input for robust pupil segmentation.
- Built a rule-based confidence estimator using pupil-area dynamics and temporal smoothing.

Othello: A chatbot that uses RL-based policies to play the othello game with user. ○ *Code*   *Aug. 2021*
- Built a modular Othello engine with self-play, move generation, and evaluation tools.
- Implemented multiple agents including Monte-Carlo rollouts and a DQN learner, and benchmarked them through scripted tournaments.