CoRL 2025 Workshop on Robotics World Modeling Proposal

Title: *Workshop on Robotics World Modeling*

Type of Event: *full-day workshop*

Organizers:

Name	Affiliation	Email
Homanga Bharadhwaj	CMU	hbharadh@cs.cmu.edu
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Shao-Hua Sun	National Taiwan University	shaohuas@g.ntu.edu.tw
Sherry Yang	Stanford & Google DeepMind	sherryy@google.com
Wenhao Yu	Google DeepMind	magicmelon@google.com

URL: *https://sites.google.com/view/rwm-rss2025*

Description:
(Please provide a short description of the proposed workshop including a discussion of a list of questions and topics that will guide the conversation in the workshop. Please discuss why this workshop can benefit the robot learning community. Please provide details of the intended audience and what sub-communities presenters and panelists will be drawn from.)

"World Model" – a model of how a world evolves in response to agents' actions – has been long explored by robotics practitioners. Various perspectives of world modeling have been studied through the lenses of model-based optimal control, reinforcement learning, controllable video generation, dynamic 3D reconstructions, and so on. And it creates significant impacts on the recent development of dexterous manipulation, locomotion, and long-horizon navigation. In particular, powered by

large data, the recent advances in the generality and precision of learning-based world models – video generation models and differentiable simulators – show tremendous opportunities in transforming robot learning and optimal control.
The goal of the workshop is to discuss different perspectives of world modeling, as well as the growing impact on robotics. The full-day workshop will bring together researchers and practitioners in robotics, physics-based modeling, and machine learning to explore the intersection of world modeling and robotic systems. We aim to create a mixture of traditional physics-based approaches and modern learning-based methods, with a focus on building more robust and generalizable robotic systems. By inviting leading experts in robot learning, physics simulation, and video generation models, we hope to spark novel ideas to help advance world modeling and robotics.

Invited Speakers/Panelists (confirmed/tentative/expected):
(Please provide a list of all expected speakers and panelists (including their email and affiliation). Please indicate if the speaker has confirmed, and if they plan to join in-person. In addition, please include a list of general topics each speaker will be presenting. Take notice of the Invited Speakers Commitment policy.)

Speakers (all speakers are also invited to join the panel):

Name	Affiliation	Topics	Confirmed	In person	Email
Kimin Lee	Assistant Professor at KAIST (Korea)	Generative world models	Yes	Yes	
Hao Su	Associate Professor at UCSD (US)	3D foundation model	Yes	Yes	
Yunzhu Li	Assistant Professor at Columbia (US)	3D world modeling	Yes	Yes	
Jiajun Wu	Assistant Professor at Stanford (US)	Intuitive Physics	Yes	Yes	
Hang Zhao	Assistant Professor at Tsinghua University (China)	Multi-modal learning & autonomous driving	Yes	Yes	
Ming-Yu Liu	VP of Research at NVIDIA (US)	Physical AI, NVIDIA Cosmos	Yes	Yes	
Agrim Gupta	Research Scientist at Google DeepMind (US)	Video Generation Model	Yes	Yes	
Bernadette Bucher	Assistant Professor at University of Michigan (US)	Visuomotor Control, Robot learning	Yes	Yes	
Leslie Kaelbling	Professor at MIT (US)	Robot learning	Yes	Yes	

As shown above, we made an active effort to ensure a strong and diverse mixture of speakers based on

- Research areas
- Professional backgrounds (industry and academia) and seniority
- Gender, ethnicity, geographic location

Proposed Format and Schedule:
(Please provide information about the format of the event (talks, panels, etc) and a tentative schedule for the event. Please note that we are planning for in-person events.)

9:00am - 10:00am: invited talk (x2, 30min each)

10:00am - 10:30am: coffee break

10:30am-12:00am: invited talk (x3, 30min each)

12:00am - 12:30am: poster lighting talk

12:30pm - 13:30pm: poster session 1 & lunch break

13:30pm - 14:30pm: invited talk (x2, 30min each)

14:30pm-15:00pm: poster lighting talk

15:00pm - 16:00pm: poster session 2 & coffee break

16:00pm - 17:00pm: invited talk (x2, 30min each)

17:00pm - 17:45pm: debate session (panel)

Plans to Encourage Participation:
(Please provide a short description of plans to encourage participation and inclusion from the broader community in your workshop beyond the invited list of speakers. Please provide specific plans for improving the diversity of your workshop participants and giving opportunities to voices not traditionally promoted at academic robotics conferences. Please add a statement of diversity and inclusion efforts)

We plan to implement the following procedures to encourage broader participation and improve inclusion:

- Call for posters and advertise for workshop participation broadly, with options for both short paper and full paper submissions.
- Lightning talks of selected posters to encourage junior researchers to publicize their work.
- Reach out to institutes and faculties in traditionally underrepresented groups, specifically, Black-in-Robotics, Women-in-Robotics, and so on.
- Advertise on social media, relevant public email lists, other conferences, etc.
- Adapt a hybrid format (both in-person and virtual participation).

- Attempt to seek funding for travel support for faculty and students from traditionally underrepresented groups.

Diversity and Inclusion:

Physical Resources:
(Please provide your estimate of audience size (virtual and in-person) and other physical resources needed for the workshop, e.g., poster boards, etc.)

We estimate an audience of 50-70 people. We would also like to request at least 10 poster boards for the poster sessions. For the invited talk, lightning talk, and debate, we would need mic, projectors, and camera for facilitating remote speakers as well as audience.

Commitment of Organizers Participation in CoRL 2025 in person:
(Please indicate below the set of organizers, who are committing to attend the workshop in person.)

The following organizers will attend CoRL 2025 in person:
Kuang-Huei Lee, Wenhao Yu, Sean Kirmani, Hamidreza Kasaei, Shao-Hua Sun <add yourself>

Acknowledgement to Attend the CoRL Workshop Organizers Meeting:
(Indicate your commitment to attend the pre-conference organizers' meeting with the CoRL2025 Workshop Chairs (virtual meeting - early July following acceptance notification).

The following organizers will attend the CoRL workshop organizers meeting:
Kuang-Huei Lee, Wenhao Yu, Sean Kirmani,<add yourself>

Willingness to merge proposed events in case of overlapping topics:
(Please indicate if you are positive in merging the proposed event with other high-quality proposals in case of acceptance.)

Yes we are positive in merging the proposed event with other high-quality proposals in case of acceptance.