

IMOL 2023

6th international workshop on

Intrinsically Motivated Open-ended Learning

Organization committee:

- Stéphane Doncieux
- Georg Martius
- Sao Mai Nguyen
- Emre Ugur
- Johann Huber

Local organization:

ISIR (Institut des Systèmes Intelligents et de Robotique) : <https://www.isir.upmc.fr/>
under the dual supervision of Sorbonne Université and CNRS



Location:

Sorbonne Université, campus Pierre et Marie Curie
4 Pl. Jussieu, 75005 Paris

Sponsored by PILLAR robot project: <https://pillar-robots.eu/>



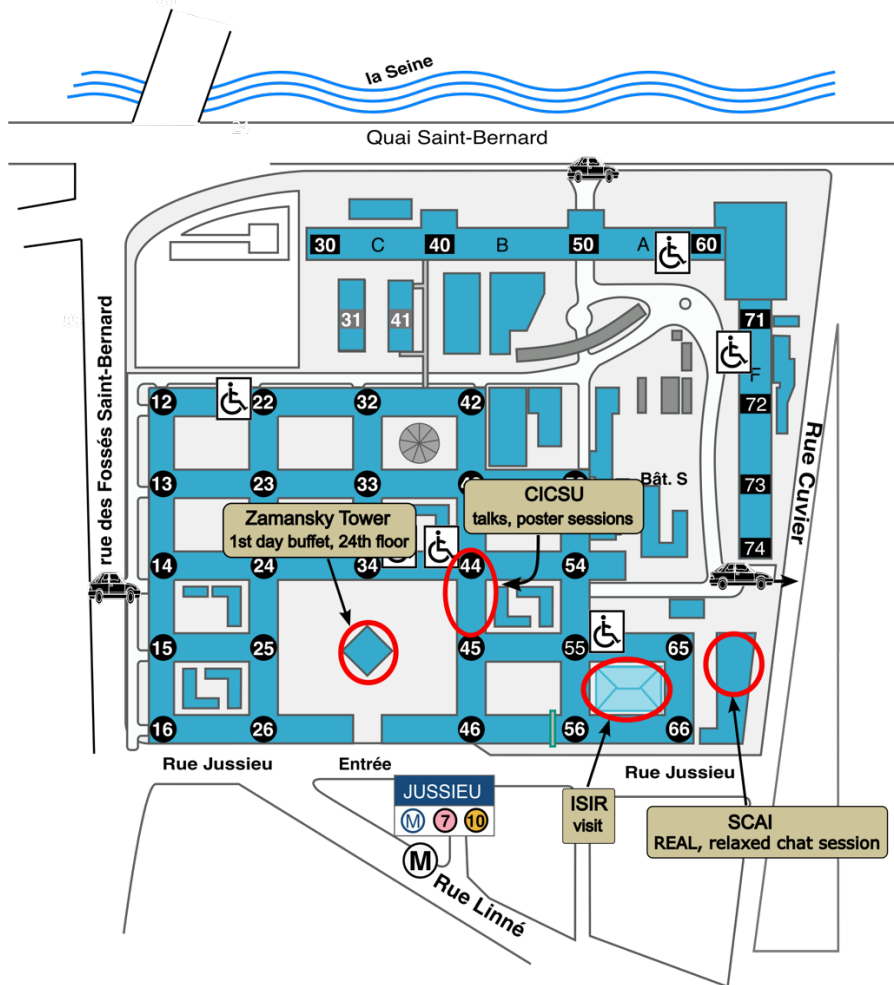
PILLAR ROBOTS



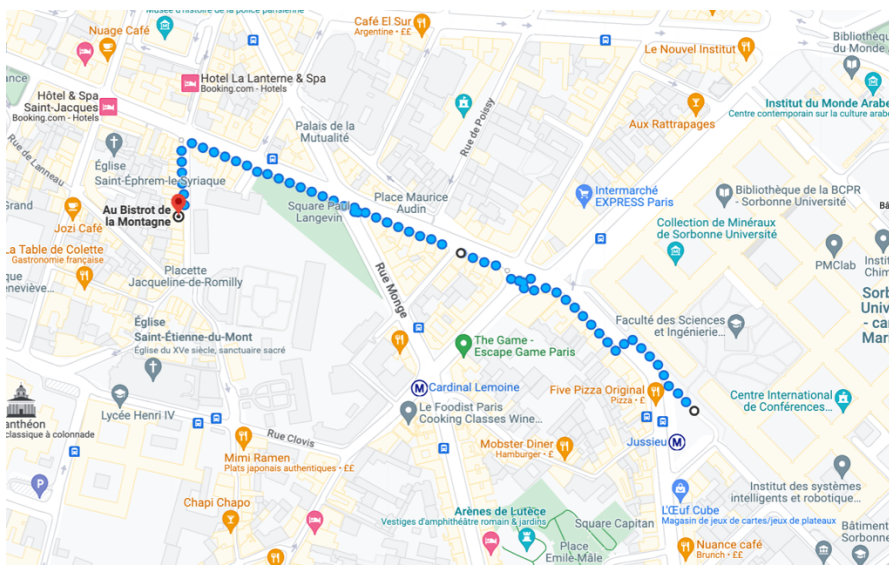
Funded by the European Union under the Horizon Europe programme

Maps

Pierre and Marie Curie Campus of Sorbonne University



September, 14th banquet : path to « Au Bistrot de la Montagne », 38 Rue de la Montagne Ste Geneviève, 75005 Paris, France



Workshop locations

- All days, registration, talks and poster sessions: CICSU (Centre International de Conférences de Sorbonne Université), 102 (hall) & 106 room, 1st floor, tower 44, corridor 44-45
- September 13th, lunch buffet: Zamansky tower, 24th floor
- September 13th, evening for the REAL session and a relaxed chat session: SCAI, Esclançon building, 1st floor
- September 14th, banquet: « Au bistrot de la montagne », 38 Rue de la Montagne Ste Geneviève
- September 15th, afternoon: ISIR visit

Panel members (Sept. 15th, 11:40)

- Gianluca Baldassarre, Institute of Cognitive Sciences and Technologies - CNR
- Pierre-Yves Oudeyer, Inria and Univ.Bordeaux
- Giada Pistilli, Sorbonne Université - Hugging Face
- Stuart Russell, UC Berkeley
- Vieri Santucci, Institute of Cognitive Sciences and Technologies - CNR
- Laure Soulier, Sorbonne Université - ISIR
- Moderator: Stéphane Doncieux, Sorbonne Université - ISIR

Program

September 13th

Start	Type	Speaker	Title
09:00	Introduction	S. Doncieux	
09:10	Talk	P.Y. Oudeyer	Autotelic agents, open-endedness and applications
09:50	Discussion		
10:00	Coffee break		
10:30	Talk	S. Calinon	Robot learning from few samples by exploiting the structure and geometry of data
11:10	Contributed talk	A. Aubret	Intrinsically motivated object representation learning
11:20	Contributed talk	C. Colas	Thinking Patterns: An Interactive and Collaborative Pattern Language for Machine Reasoning
11:30	Contributed talk	T.J. Ringstrom	Towards Open-Endedness on a Compositional Foundation: Evaluating Plans and Items with Hierarchical Empowerment Gain
11:40	Contributed talk	A. Dahmani	Toward Understanding Automated Causal Curriculum Learning in Humans and Reinforcement Learning Agents
11:50	Discussion		
12:00	Lunch Break	<i>Zamansky Tower, 24th floor</i>	
13:30	Poster session	<i>CICSU hall</i>	
15:10	Talk	M. Hoffmann	(How) Can we spot active exploration in the behavior of young infants?
15:50	Talk	J. Chu	In praise of folly: goals, play, and problem-making
16:30	Coffee break		
17:00	Talk	J. Clune	Open-ended and AI-generating Algorithms in the Era of Foundation Models
17:40	Discussion		
17:50	REAL & relaxed chat session	SCAI	
18:50	End of the day		

September 14th

Start	Type	Speaker	Title
09:00	Talk	R. Duro	PILLAR-Robots: An Approach to Making Autonomous Robots Useful
09:40	Talk	V. Santucci/ G. Baldassare	Integrating multiple motivations for autonomous open-ended learning
10:20 Discussion			
10:30 Coffee break			
11:00	Talk	O. Sigaud	Towards Inferential Social Learning in Teachable Autotelic Agents
11:40	Talk	G. Martius	Intrinsic Motivation meets Model-based RL - a Dream Team
12:20 Discussion			
12:30 Lunch break <i>CICSU hall</i>			
14:00	Talk	E. Ugur	DeepSym: Discovering symbols for planning in robotics
14:40	Talk	J. Huber	Dataset generation with Quality-Diversity: Application to Grasping and lessons for Open-Endedness
15:20	Contributed talk	M. Gilles	Enhancing Efficiency of Robot Picking Using Sim-to-Application Transfer and Interest-Driven Domain Adaption
15:30	Contributed talk	M. Zadem	Goal Space Abstraction in Hierarchical Reinforcement Learning via Set-Based Reachability Analysis
15:40 Discussion			
15:50 Coffee break			
16:20 Poster session <i>CICSU hall</i>			
18:00 End of the day			
19:30	Banquet	<i>"Au Bistrot de la montagne"</i>	

September 15th

Start	Type	Speaker	Title
09:00	Talk	F. Xu	Learning in infancy: language and play
09:40	Talk	S. M. Nguyen	Hierarchical actions : from human movement analysis to complex sensorimotor skills learning
10:20 Discussion			
10:30 Coffee break			
11:00	Talk	L. Soulier	Behind the journey of ChatGPT: on overview of Large Language Models
11:40	Panel discussion		IMOL challenges
12:20 Discussion			
12:30 Closing remarks			
12:45 End of the meeting			
14:00 ISIR visit			

Poster session 1, September 13th, 13:30

(Selected posters indicated with a **title in bold font** will be introduced by a short talk)

1. ***Toward Understanding Automated Causal Curriculum Learning in Humans and Reinforcement Learning Agents***, Anya Dahmani, Eunice Yiu, Nan Rosemary Ke, Tabitha Edith Lee, Oliver Kroemer, Alison Gopnik
2. ***Thinking Patterns: An Interactive and Collaborative Pattern Language for Machine Reasoning***, Cédric Colas, Nicolas Yax, Clément Romac, Laetitia Teodorescu, Pierre-Yves Oudeyer, Stefano Palminteri
3. ***Intrinsically motivated object representation learning***, Arthur Aubret, Céline Teulière, Jochen Triesch
4. ***Towards Open-Endedness on a Compositional Foundation: Evaluating Plans and Items with Hierarchical Empowerment Gain***, Thomas James Ringstrom
5. *Flexible Social Dynamics Emerge Through Model-Based Intrinsic Motivation*, Violet Xiang, Logan Cross, Nick Haber
6. *Computationally Modelling Self-Determination Theory for HCI: The Case of Competence*, Erik Lintunen, Christian Guckelsberger, Sebastian Deterding
7. *Limitations of Asocial Intrinsic Motivation in Meta Imitation Learning*, Grgur Kovač, Rémy Portelas, Peter Ford Dominey, Pierre-Yves Oudeyer
8. *Codeplay: Autotelic Learning through Collaborative Self-Play in Programming Environments*, Laetitia Teodorescu, Cédric Colas, Matthew Bowers, Thomas Carta, Pierre-Yves Oudeyer
9. *Combining Intrinsic and Extrinsic Motivations in a Robotics Cognitive Architecture*, Andrea Morelli, Marco Mirolli, Vieri Giuliano Santucci
10. *Maximizing the Information Capacity of Neurons for Continual Learning*, Léo Coquet, Alexandre Pitti, Claudio Weidmann, Ngoc-Son Vu
11. *Epistemic Uncertainty-based Exploration of Affordances*, Fedor Scholz, Johannes Bertram, Martin V. Butz
12. *Mixing Novelty and Competence-based Intrinsic Motivations in Deep Reinforcement Learning*, Gianluca Maselli, Vieri Giuliano Santucci
13. *Neuro-Symbolic Architecture for Extraction and Application of Higher-Order Rules Using Serial-Order Codes*, Krzysztof Lebioda, Alexandre Pitti, Fabrice O. Morin, Alois Knoll
14. *Improving object grounding in robot instructions*, Amric Trudel

15. *From Sound Primitives Learning to Structure Extraction: Brain-inspired Model of Infant Early Vocal Learning*, Xiaodan Chen, Alexandre Pitti, Mathias Quoy, Nancy F. Chen
16. *Should I stay or should I go? Addressing the curiosity / boredom dilemma of a domestic robot*, Daniela Pamplona, Antoine Manzanera
17. *Grounding of Action Verbs Based on Similarity of Modular Neural Networks Parameters*, Michal Vavrecka
18. *Curiouser and Curiouser: Children's intrinsic exploration of mazes and its effects on reaching a goal*, Eliza Kosoy, David Chan, Jasmine Collins, Deepak Pathak, Pulkit Agrawal, Alexei A Efros, Trevor Darrell, Alison Gopnik

Poster session 2, September 14th, 16:20

(Selected posters indicated with a **title in bold font** will be introduced by a short talk)

1. ***Enhancing Efficiency of Robot Picking Using Sim-to-Application Transfer and Interest-Driven Domain Adaption***, Maximilian Gilles, Rania Rayyes
2. ***Goal Space Abstraction in Hierarchical Reinforcement Learning via Set-Based Reachability Analysis***, Mehdi Zadem, Sergio Mover, Sao Mai Nguyen
3. *Enhancing Agent Communication and Learning through Action and Language*, Hugo Caselles-Dupré, Olivier Sigaud, Mohamed Chetouani
4. *Language Grounded Generative Quality-Diversity With Decision Transformers*, Achkan Salehi, Stephane Doncieux
5. *Visit the lab scenario: exploration in model-based reinforcement learning*, Augustin Chartouny, Keivan Amini, Mehdi Khamassi, Benoît Girard
6. *Regularity as Intrinsic Reward for Free Play*, Cansu Sancaktar, Justus Piater, Georg Martius
7. *Learning Hierarchical World Models with Adaptive Temporal Abstractions from Discrete Latent Dynamics*, Christian Gumbsch, Noor Sajid, Georg Martius, Martin V. Butz
8. *Open-ended Learning of Goals with Non-stationary Interdependencies in Autonomous Robots*, Alejandro Romero, Gianluca Baldassarre, Richard J. Duro, Vieri Giuliano Santucci
9. *Unsupervised Discovery of Safe Skills for Robotics*, Charly Pecqueux-Guézénec, Nicolas Perrin-Gilbert, Stephane Doncieux

10. *Directing Open-ended Learning through Verbally Expressed Purposes*, Emilio Cartoni, Gianluca Baldassarre, Gianluca Cioccolini
11. *Prerequisite structure discovery for an intelligent tutoring system based on intrinsic motivation*, Louis Annabi, Sao Mai Nguyen
12. *Unveiling the Ontological Implications of Motivation and Directedness Towards Inostensible Referents: Evaluating Meinong and Russell's Perspectives*, Alexis Rozanski
13. *An Intrinsic Motivation for Self-Representation*, Tracey Mills, Cédric Colas, L. A. Paul, Julian De Freitas, Tomer Ullman, Joshua B. Tenenbaum
14. *Diverse Offline Imitation via Fenchel Duality*, Marin Vlastelica , Pavel Kolev, Jin Cheng, Georg Martius
15. *Specific Curiosity is a Holistic Pursuit*, Nadia M. Ady
16. *Studying reasoning in a family of large language models*, Nicolas Yax, Hernan Anllo, Stefano Palminteri
17. *Rapid Learning without Catastrophic Forgetting in the Morris Water Maze*, Raymond Wang, Jaedong Hwang, Akhilan Boopathy, Ila R Fiete
18. *Successive Refinement in Continual Learning: A Study on Spatial Representations*, Nicola Catenacci Volpi, Hippolyte Charvin, Daniel Polani
19. *Biologically inspired use of self-organizing maps for continuous learning in humanoid robots*, Magdalena Yordanova