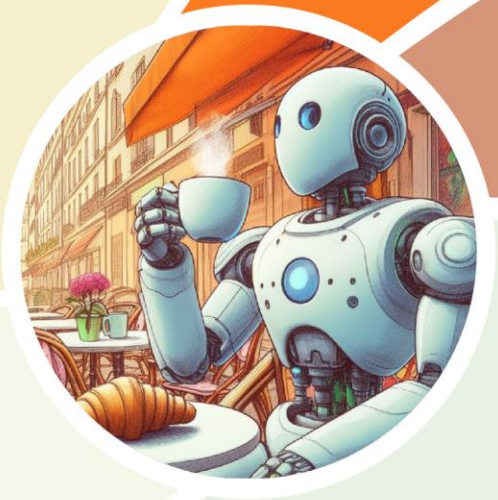
Humanoids 2024



IEEE-RAS International Conference on Humanoid Robots

22–24 November, 2024

Nancy, France

Welcome!

It is our pleasure to invite you to attend the 23rd IEEE RAS International Conference on Humanoid Robotics – HUMANOIDS 2024 – in Nancy, a beautiful French city rich with history, culture, and intellectual legacy.

Nancy is a classic European city, with an historic center that is perfect for exploring on foot. Historically, it was the capital of the Duchy of Lorraine, nicknamed the "capital of Eastern France" in the 19th century and a major center of the Art Nouveau. Its city center is marked by Place Stanislas, a large square that is now a UNESCO World Heritage Site, surrounded by the Opera, the Town Hall, the Museum of Fine Arts and the historical building of the first University of Nancy. But besides history, architecture and art, this town holds a special place in the world of science as the birthplace of Henri Poincaré, one of the most brilliant mathematicians and theoretical physicists of the 19th and early 20th centuries. Poincaré's groundbreaking work in mechanics, topology, geometry and chaos theory continues to influence scientific fields to this day. Many of you have certainly come across his name when studying the foundational principles in robotics and automation. As we come together to explore the latest advancements in humanoid robotics, it feels especially fitting to be in this city.

Much has changed since the last HUMANOIDS in presence in Europe (Munich, Germany, 2021): the robotics market has been growing, but the humanoids market has exploded!

We are excited to bring you the biggest exhibition and competition you have ever seen at the HUMANOIDS conference. More than 30 exhibitors and sponsors are going to show you their latest products and advances in robotics, demonstrating new robots, sensors, and actuators. We will have two parallel competitions: the humanoids walking competition, extending to the one of HUMANOIDS 2023 at Austin, Texas; and the euROBIN (European network of Excellence in Robotics and AI) competition, where industrial arms, legged and personal robots compete to

solve several loco-manipulation tasks. An industry panel followed by live on-stage demos will promote discussions about the many open challenges for commercial humanoid robots.

This HUMANOIDS 2024 will also have a rich scientific program, with 6 plenary keynote speakers, oral and interactive sessions, and a debate on cognitive robotics and AI – a timely discussion in an era where AI is often portrayed as the solution to every challenge in robotics.

It feels more important than ever to reach out to the general public, and to the young generation in particular, to show them the advances in robotics and explain what robotics and AI can actually do. For this reason, HUMANOIDS 2024 marks the beginning of the “International Robotics Week in Nancy”. We have prepared a rich outreach program that will bring at the conference more than 1000 people, to attend robotics hands-on classes, listen to public talks, attend the conference or have a guided tour of the exhibition and competition area. This is unprecedented and I take this opportunity to thank our sponsors, the IEEE Robotics and Automation Society and Inria, which made this great outreach program possible.

In today’s world, technological progress also calls for environmental responsibility. As part of our commitment to sustainability, HUMANOIDS 2024 has taken steps to reduce the conference's carbon footprint: we encouraged travel by train for Europeans; we banned single-used plastic, and one meal will be vegan for all participants.

The Humanoids community is growing, but still has one of the lowest percentages of women leaders and researchers in robotics. This year we have brought the first Women in Engineering Luncheon at HUMANOIDS, which we hope is the first of many; we have increased the travel grants for young researchers, through the RAS Member Support Program, the IDEA Awards and the Kanako Miura Awards for young female researchers. We have also organized free childcare onsite for the conference attendees. All these initiatives were possible thanks to the support of the IEEE Robotics and Automation Society.

Finally, our conference participants will enjoy numerous social events and opportunities for networking and getting in contact with RAS leaders. Every day, RAS TC and Committees organize Happy Hours to present their activities. The Welcome Party will follow the Ceremony of the Opening of Nancy’s Christmas Market, with a live show in Place Stanislas and the lighting of the Christmas Tree. The Banquet will feature a concert by the University of Lorraine’s Student Symphonic Orchestra. The Farewell Party will conclude the conference with a gathering at the Opera of Lorraine, a historical building in classic and art nouveau style. These events will offer French cuisine and wine, giving you a truly authentic French experience.

The entire HUMANOIDS 2024 Organizing Committee dedicated tremendous effort to ensure you enjoy a memorable conference. We really hope you will enjoy these 3 days full of exciting progress in humanoid robotics and you will come back home with the sweetest souvenir of Nancy!

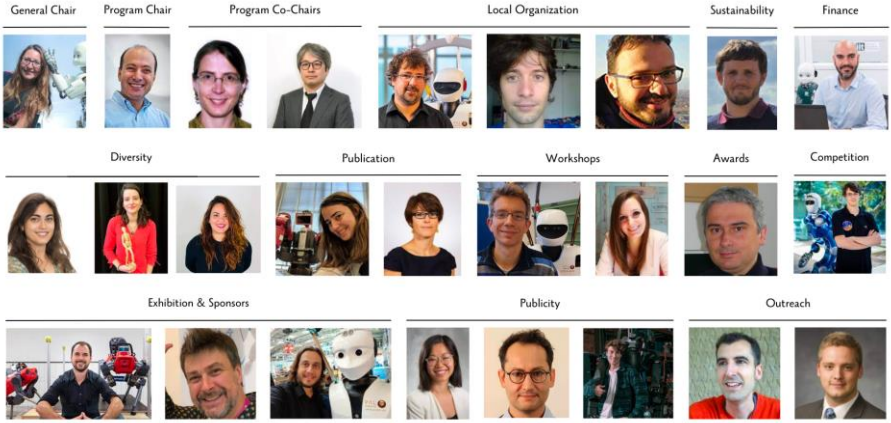
Serena Ivaldi
General Chair

Tamim Asfour
Program Chair

Quick Reference

Clicking on the humanoids logo in the footer will always bring you back to this quick reference!

Organization Committee



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Zhou, Chengxu

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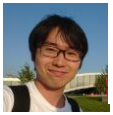
Italian Institute of Technology

Justin Carpentier
École Normale Supérieure



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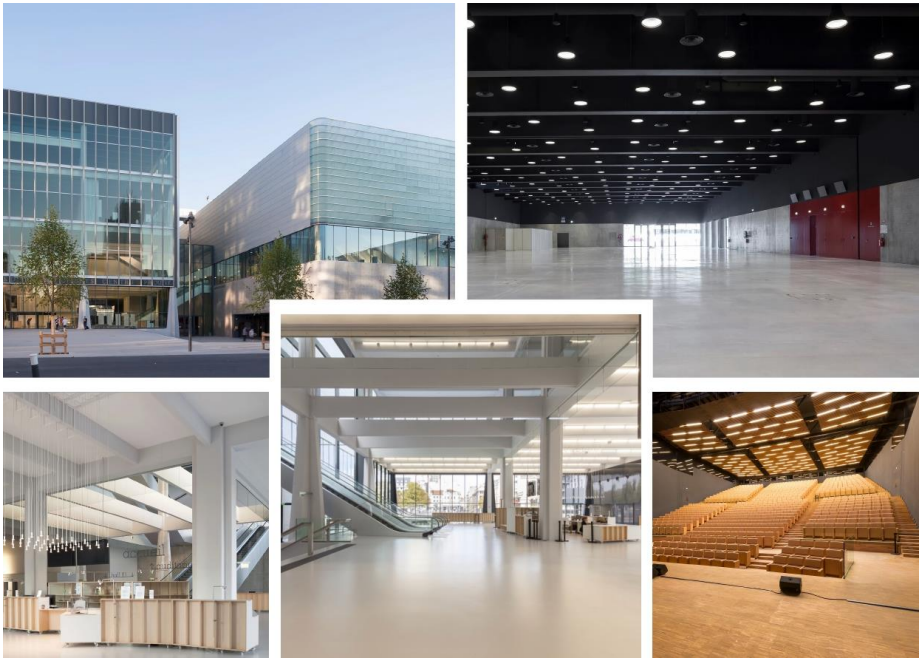
University of Tokyo

Jan Peters
Technical University of Darmstadt

Luis Sentis
The University of Texas at Austin

Michael Yu Wang
Great Bay University

Venue



General Information

Humanoids 2024 will take place at the Prouvé Convention Centre located in the city center of Nancy, in front of the train station.

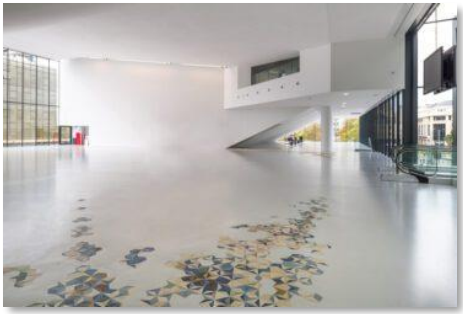
Centre Prouvé, 1 place de la République – 54000 Nancy

48.688308456372646, 6.177111990158859

https://maps.app.goo.gl/8kGPM7eeYeJ4uVYu9

Oral Session – Amphitheatre 450-850

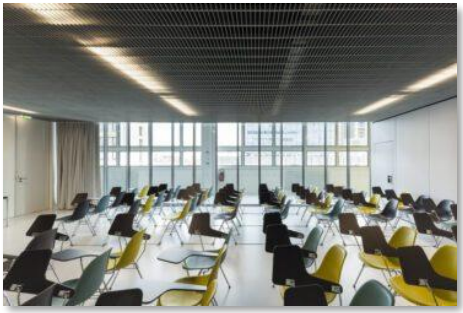
Poster Session – Foyer 850



Exhibition & Competition – Halls 1 & 2

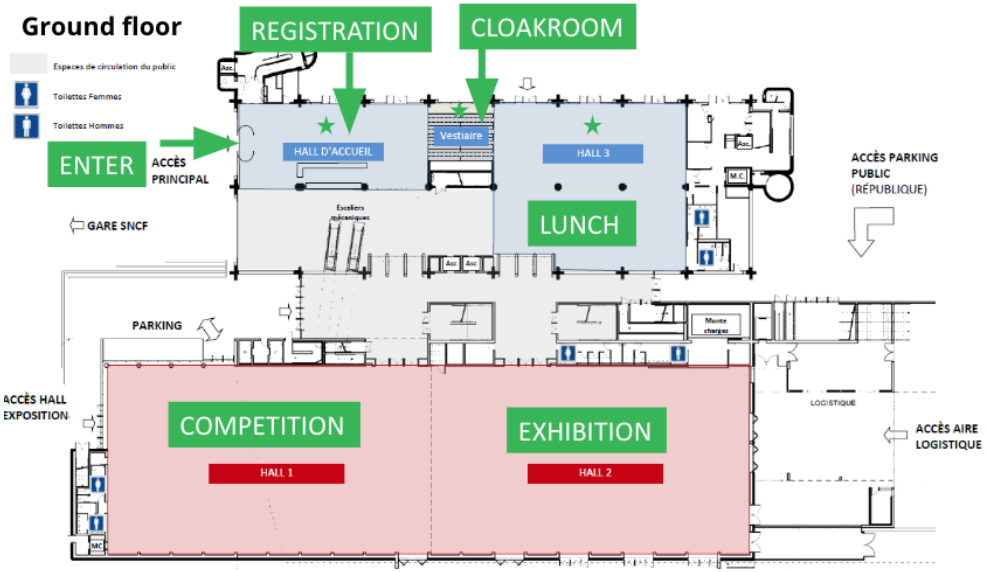
Banquet – Espace Panoramique

Workshops: Rooms 101-204



Floor Plan

Centre de congrès Prouvé



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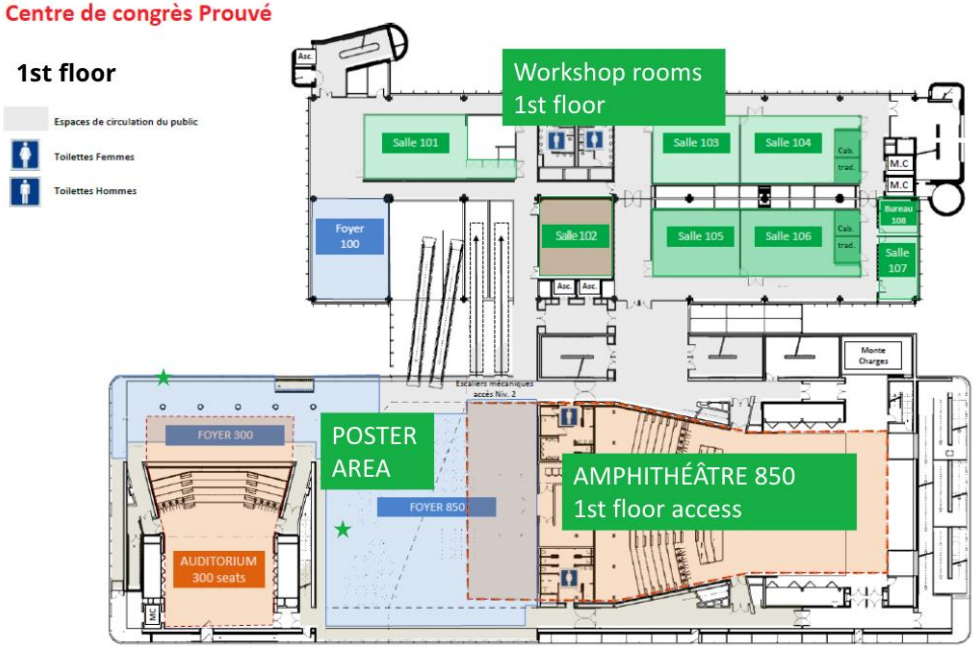
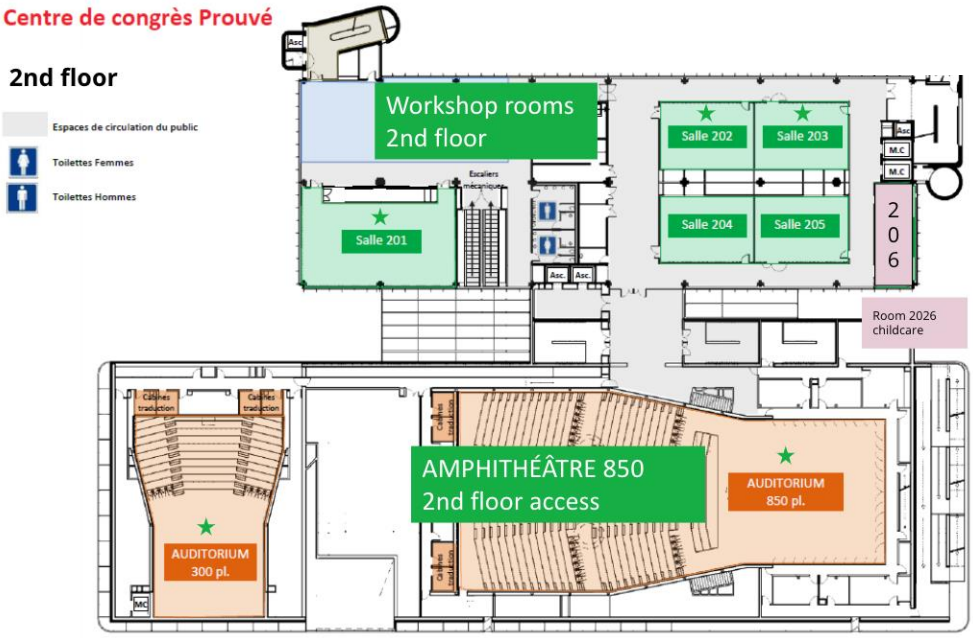


Centre de congrès Prouvé

2nd floor



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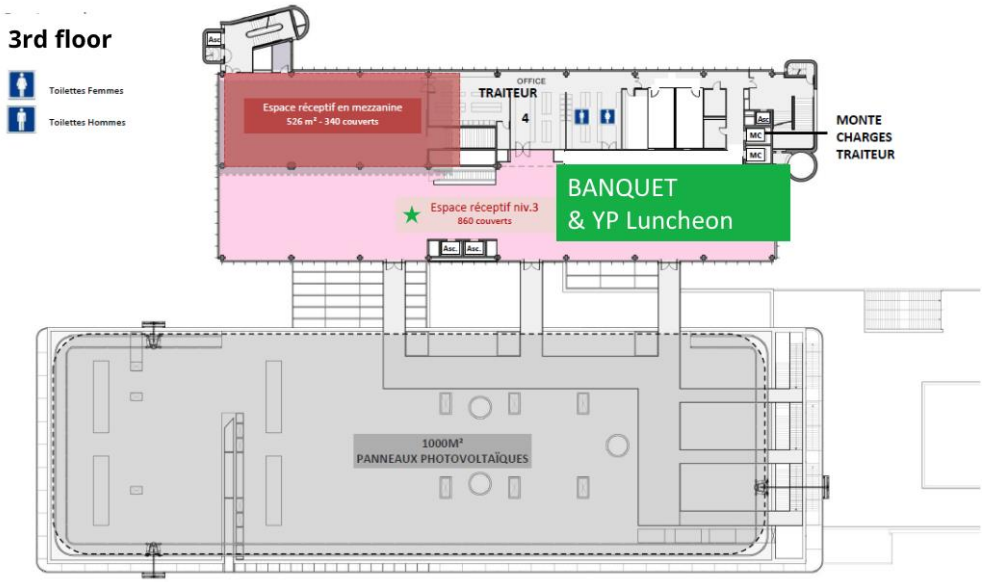
3rd floor



Wi-Fi Information

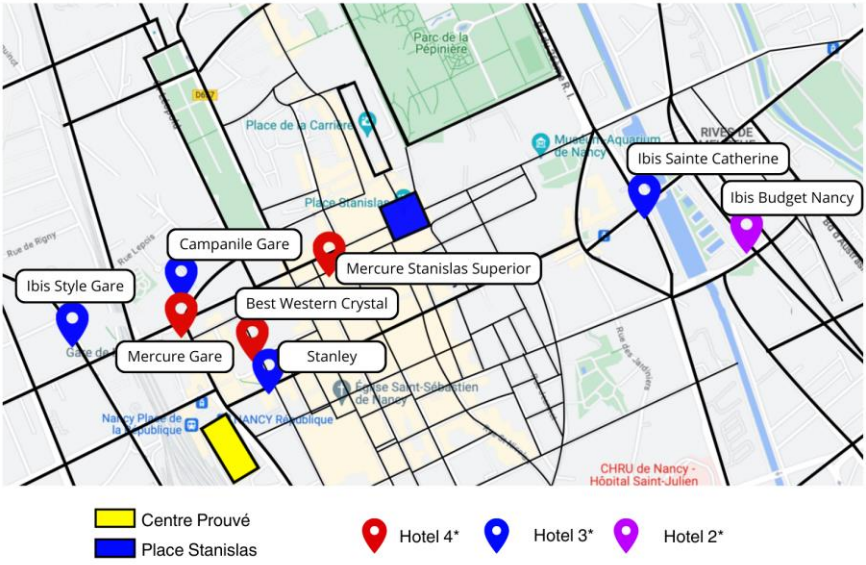
WIFI n.1: eduroam
Please use your usual login information as provided by your university or institution.

WIFI n.2: RobWeek1
Login: roboticsweek2024
Password: Humanoids2024euROBIN2

Hotel Information

Humanoids 2024 will take place at the Prouvé Convention Centre located in the city center of Nancy, France: 1, place de la République – 54000 Nancy

In collaboration with Destination Nancy, the City of Nancy and its Tourist Office, we are proposing several hotel rooms at a preferential rate in the following hotels:



4* Mercure Gare (140/155 euro single/double)

Mercure Stanislas Superior (136/156 euro single/double)

Best Western Crystal (156/167 euro single/double)

3* Campanile Gare (94/108 euro single/double)

Ibis Style Gare (120/130 euro single/double)

Ibis Sainte Catherine (90/98 euro single/double)

Stanley (105/115 euro single/double)

2* Ibis Budget Nancy (73/83 euro single/double)

Reservation at a fixed preferential rate is available from 20 to 30 November 2024, to allow you to extend your stay (visit Nancy, participate in the euRobin week, etc.).

If you do not wish to use the reservation system proposed by the City of Nancy, do not worry: the Conference Center Prouvé is in the city center of Nancy, next to the train station, and you will find several hotels within walking distance.

Important Information! The first day of the conference is the inaugural day of the Christmas Market of Nancy and the festivities of Saint Nicolas. The Christmas market attracts a lot of tourists, so we suggest booking the hotel in advance if you want to find one in the city center.

IEEE HUMANOIDS 2024

	Fr., Nov 22	Sat., Nov 23	Sun., Nov 24
09:00–10:00	Workshops & Tutorials 1	Welcome Oral Session 1	Oral Session 3
10:00–10:30		Coffee Break	Coffee Break
10:30–11:00	Coffee Break	Interactive Session 1	Interactive Session 3
11:00–11:30	Workshops & Tutorials 2		
11:30–12:30		Plenary 1	Plenary 3
12:30–13:30	Lunch Break		
13:30–14:30	Workshops & Tutorials 3	Oral Session 2	Oral Session 4
14:30–15:00		Coffee Break	Coffee Break
15:00–15:30	Coffee Break	Interactive Session 2	Interactive Session 4
15:30–16:00	Workshops & Tutorials 4		
16:00–16:30		Plenary 2	Plenary 4
16:30–17:00		Panel 1	Panel 2
17:00–17:30			
17:30–18:00		Exhibition & Robotics Competition	Award Ceremony
Evening	18:30 Welcome Reception	19:00 Banquet	18:30 Farewell Reception

Important Information: Coffee breaks are served in the Exhibition & Competition area (Hall 1 & 2). Lunch is served in Hall 3.

Staff members will wear a red vest.

External visitors, children and people from the public will wear a light blue vest. They cannot wander around the conference unattended by a staff member. If you see them alone, report them to the staff and bring them to the entrance.

Press will wear a yellow armband with the press sign. There are press tours scheduled on Friday and Saturday

Workshops

Overview

All workshops & tutorials listed below will take place on Friday, 22 November at the Centre Prouvé conference center. Participants registered to workshops can attend any workshops they wish.

Workshop general hours: 9:00–18:00, lunch break is at 12:30–13:30.

WS1 Real-World Physical and Social Human-Robot Interaction
Room: 103
Duration: Full day
https://rwhri.github.io/Humanoids2024_workshop/

→ Jump to the detailed description in the appendix

WS2 Human-Robot-Avatar Interaction and Collaboration: Enhancing robot's and avatar's active social capabilities
Room: 203
Duration: Half day (morning)
https://www.iri.upc.edu/workshops/hra24/index.html

→ Jump to the detailed description in the appendix

WS3 Designing Interactive Humanoids: Learning Tasks through Interaction with Humans
Room: 203
Duration: Half day (afternoon)
https://humanoids-ws-2024.github.io/

→ Jump to the detailed description in the appendix

WS4 **Human Movement Modeling for Human-Robot Interaction**

Room: 104

Duration: Full day

https://project.inria.fr/hummodel2024humanoids/

→ Jump to the detailed description in the appendix

WS5 **Designing Humanoids: How much should we learn from humans?**

Room: 105

Duration: Full day

https://sites.google.com/view/designinghumanoids/home

→ Jump to the detailed description in the appendix

WS6 **Towards general-purpose robots: connecting generative artificial intelligence to humanoids**

Room: 204

Duration: Half day (afternoon)

https://adr-association.eu/events/adra-cross-community-workshop-towards-general-purpose-robots-connecting-generative

→ Jump to the detailed description in the appendix

WS7 **Workshop on Humanoid Soccer Robots**

Room: 202
Duration: Full day
https://whsr-2024.github.io/

→ Jump to the detailed description in the appendix

WS8 **Can we build Baymax? Part IX. Learning and Data Collection for Skillful Humanoid**

Room: 101
Duration: Full day
https://baymax.org/workshop/2024/

→ Jump to the detailed description in the appendix

T1 **Large Language Models for Robot Control**

This is an outreach activity and is open to University students at all levels
Room: 205
Duration: Full day

Scientific Program

To get a brief overview of the program, one-pagers are provided further below for the overall program and the keynotes. Detailed information on each interactive session is provided via papercept, as individually linked in the following schedules of each day.

Friday, November 22

Please note: You can find a detailed list of Workshops in the previous chapter.

09:00	**–**	**10:30**	**Workshop and Tutorials**
10:30	**–**	**11:00**	**Coffee Break**
12:30	**–**	**13:30**	**Lunch**
13:30	**–**	**15:00**	**Workshop and Tutorials**
15:00	**–**	**15:30**	**Coffee Break**
15:30	**–**	**18:00**	**Workshop and Tutorials**
18:30	**–**	**22:00**	**Welcome Reception**

Saturday, November 23

09:00 – 09:20	**Welcome**
09:20 – 10:00	**Oral Session 1**
09:20 – 09:30	*Kento Kawaharazuka et al. – Continuous Object State Recognition for Cooking Robots Using Pre-Trained Vision-Language Models and Black-Box Optimization*
09:30 – 09:40	*Dionis Totsila et al. – Words2Contact: Identifying Support Contacts from Verbal Instructions Using Foundation Models*
09:40 – 09:50	*Seongkyeong Moon, Eunho Sung, and Jaeheung Park – Kernel PCA-Based Hand Synergy for Efficient Robot Hand Teleoperation Using Glove Interface*
09:50 – 10:00	*Connor Herron et al. – PANDORA: The Open-Source, Structurally Elastic Humanoid Robot*
10:00 – 10:30	**Coffee Break**
10:30 – 11:30	**Interactive Session 1** See papercept / SaI_1P for details
11:30 – 12:30	**Plenary Session 1**
	Luis Sentis – The Point of Humanoid Robots
	Kento Kawaharazuka – History and Future of Tendon-driven Musculoskeletal Humanoids
12:30 – 13:30	**Lunch Break**

13:30	**– 14:30**	**Oral Session 2**
13:30	– 13:40	*Esteve Valls Mascaro and Dongheui – Lee Know Your Limits! Optimize the Robot's Behavior through Self-Awareness*
13:40	– 13:50	*Haruki Abe et al. – Latent Space Curriculum Reinforcement Learning in High-Dimensional Contextual Spaces and Its Application to Robotic Piano Playing*
13:50	– 14:00	*Shintaro Inoue et al. – CubiXMusashi: Fusion of Wire-Driven CubiX and Musculoskeletal Humanoid Musashi Toward Unlimited Performance*
14:00	– 14:10	*Luigi Penco et al. – Mixed Reality Teleoperation Assistance for Direct Control of Humanoids*
14:10	– 14:20	*Shuang Wang, Ko Ayusawa, and Eiichi Yoshida – Measuring and Analyzing Human Wide-Area Contact Motion Using Tactile Sensors*
14:20	– 14:30	*Sahand Shaghaghi – Towards an Interaction Architecture for the iCub Robot: Social Gaze Space Model Adaptation for Social Interaction*
14:30	**– 15:00**	**Coffee Break**
15:00	**– 16:00**	**Interactive Session 2** See papercept / SaI_2P for details
16:00	**– 16:30**	**Plenary Session 2**
		Michael Yu Wang – Rapid Rise of Humanoid Robots in China
16:30	**– 17:30**	**Panel – Humanoids and Industry**
17:30	**– 18:00**	**Exhibition & Robotics Competition**
19:00	**– 22:00**	**Banquet**

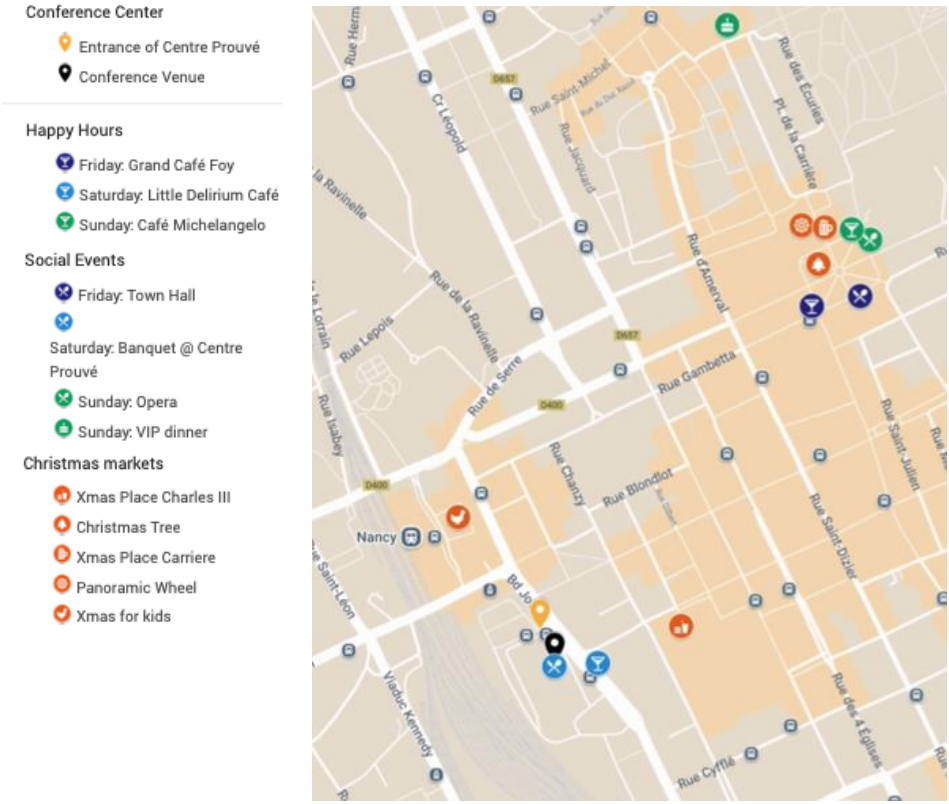
Sunday, November 24

09:00 – 10:00	**Oral Session 3**
09:00 – 09:10	*Yunho Kim et al. – Not Only Rewards but Also Constraints: Applications on Legged Robot Locomotion*
09:10 – 09:20	*Jiatao Ding et al. – Robust Quadrupedal Jumping with Impact-Aware Landing: Exploiting Parallel Elasticity*
09:20 – 09:30	*Jiayi Wang et al. – NAS: N-Step Computation of All Solutions to the Footstep Planning Problem*
09:30 – 09:40	*Giulio Romualdi et al. – Online DNN-Driven Nonlinear MPC for Stylistic Humanoid Robot Walking with Step Adjustment*
09:40 – 09:50	*Carlos Isaac Gonzalez Bolivar and Luis Sentis – Guiding Collision-Free Humanoid Multi-Contact Locomotion Using Convex Kinematic Relaxations and Dynamic Optimization*
09:50 – 10:00	*Rajesh Subburaman and Olivier Stasse – Delay Robust Model Predictive Control for Whole-Body Torque Control of Humanoids*
10:00 – 10:30	**Coffee Break**
10:30 – 11:30	**Interactive Session 3** See papercept / SuI_1P for details
11:30 – 12:30	**Plenary Session 3**
	Jan Peters – Inductive Biases for Learning of Anthropomorphic Robots
	Justin Carpentier – Towards Fully Differentiable Control Architecture for Robotics: Simpler, Nimbler, Faster, Stronger
12:30 – 13:30	**Lunch Break**

13:30	**– 14:30**	**Oral Session 4**
13:30	– 13:40	*Hassan Ali et al. – Robots Can Multitask Too: Integrating a Memory Architecture and LLMs for Enhanced Cross-Task Robot Action Generation*
13:40	– 13:50	*Mohammed Shameer Abubucker et al. – TactileMemory: Multi-Fingered Simultaneous Shape and Pose Identification Using Contact Traces*
13:50	– 14:00	*Daichi Saito et al. – APriCoT: Action Primitives Based on Contact-State Transition for In-Hand Tool Manipulation*
14:00	– 14:10	*Dongying Tian, Xiangbo Lin, and Yi Sun – Adaptive Motion Planning for Multi-Fingered Functional Grasp Via Force Feedback*
14:10	– 14:20	*Uksang Yoo et al. – RoPotter: Toward Robotic Pottery and Deformable Object Manipulation with Structural Priors*
14:20	– 14:30	*Shogo Sawaguchi et al. – Vlimb: A Wire-Driven Wearable Robot for Bodily Extension, Balancing Powerfulness and Reachability*
14:30	**– 15:00**	**Coffee Break**
15:00	**– 16:00**	**Interactive Session 4** See papercept / SuI_2P for details
16:00	**– 16:30**	**Plenary Session 4**
		Agnieszka Wykowska – The Role of Humanoid Robots in Cognitive Neuroscience
16:30	**– 17:30**	**Panel – Cognitive Humanoids and Generative AI**
17:30	**– 18:00**	**Award Ceremony**
18:30	**– 22:00**	**Farewell Reception**

Social Events

Check this map with the important locations of the conference and its social events:



Welcome Reception

22 November at 19:45

Town Hall, Place Stanislas – 54000 Nancy

we suggest you arrive at 19:15 to watch the music & lights show in Place Stanislas

The welcome party for the conference is set to take place in the distinguished Salon of the Nancy City Hall (*Hôtel de Ville*), located in the city centre of Nancy, France, in the iconic Place Stanislas (UNESCO heritage, elected best monument in France 2021). This event, held in one of the city's most historic and elegant venues, promises to provide a perfect blend of sophistication and warm hospitality. The Mayors of Nancy and Karlsruhe will join us to celebrate the beginning of the conference.

Important information: November 22 is the inauguration of the Christmas Market in Nancy. At 19:15, all the lights in the buildings of Place Stanislas will be off, and there will be a music & lights show, where the buildings of Place Stanislas become a live cinema showing some animations with lights and sounds. This show will end at around 19:30-19:45 with the ceremony of lighting the Christmas tree, which is on the right side of Place Stanislas in front of the Museum of Fine Arts. Once the show is over, the conference participants will be allowed to enter the Town Hall and enjoy the Welcome Party. A Humanoids 2024 roll-up sign will indicate the way.

Therefore, we suggest participants do the following:

- 18:45: enjoy the Happy Hour of the RAS Young Reviewers Program in Grand Café Foy in Place Stanislas (registration required, limited spots)
- 19:15: watch the music & lights show in Place Stanislas (you will need to go outside)
- 19:40: watch the Christmas tree being lit, in Place Stanislas
- 19:45: go to the Town Hall, in Place Stanislas, to enjoy the Welcome party

Banquet

23 November at 19:00

Centre Prouvé, top floor

The banquet will be located on the top floor of Centre Prouvé. You will enjoy a 3-course French cuisine dinner and taste our local wine. The University of Lorraine's Student Symphonic Orchestra will also perform for us during the banquet, twice! The first part of their concert is at 19:35, so please do not arrive late at the banquet or you will disrupt the concert.

Farewell Reception

24 November at 18:30

Nancy Opera, 9 Place Stanislas, 54000 Nancy

As the conference in Nancy draws to a close, attendees will have the unique opportunity to experience a grand farewell party at the prestigious Nancy Opera House (Opéra National de Lorraine) in the city center of Nancy, France, again in the iconic Place Stanislas. This event promises to be a memorable finale to the conference, combining elegance, culture, and a touch of local charm.

Happy Hour hosted by the IEEE-RAS Young Reviewers Committee

22 November at 18:00

Gran Café Foy, Place Stanislas, 54000 Nancy

How often do you receive shallow and poorly written reviews for your papers? Have you ever doubted the right way to review somebody else's work? Do you really know everything about the review process of the conference/journal where you would like to submit your contribution? If these questions sound familiar to you and you want to gain deeper knowledge about related topics, join the Young Reviewers Program Reception!

The objective of the Young Reviewers Program is to assist and guide RAS members toward the best practices in peer review of scientific papers. This event intends to inform the community about RAS's review process and suggest the best guidelines for reviewing a scientific paper. Both Senior Reviewers who believe that we never stop learning and Young Reviewers willing to dive into the world of peer review are welcome to drop by, grab a drink, and join us!

There is NO CHARGE for this event, however space is limited. Registration required.

Happy Hour hosted by the IEEE-RAS TC on Whole-Body Control and TC on Model-Based Optimization for Robotics

23 November at 18:00
Little Delirium Café, 13-15 Bd Joffre, 54000 Nancy

This event has limited spots available. Registration required.

Happy Hour hosted by the IEEE-RAS TC on Cognitive Robotics

24 November at 18:00
Café Michel Angelo, 8 Place Stanislas, 54000 Nancy

Why can robots outperform humans in certain tasks but struggle with others a toddler can handle with ease? What's the minimum set of skills a machine needs to be considered "intelligent," and how far (or close!) are we to achieving that?

Cognitive robotics dives deep into these intriguing questions. This multidisciplinary field blends adaptive robotics, cognitive science, artificial intelligence, and models based on biological and embodied cognition to push the boundaries of what robots can do.

Curious? Whether you're a seasoned pro or a newcomer, you're invited to join the Technical Committee on Cognitive Robotics for a Happy Hour! Learn about our mission, current activities, and how we support the community while having a drink with others who share your interests.

Don't miss out! The event will take place in Place Stanislas right before the Farewell Party!

This event has limited spots available. Registration required.

Empowering the Next Generation: IEEE Young Professionals Luncheon

23 November at 12:30
Centre Prouvé, Banquet Room (top floor)

The IEEE RAS Young Professional Committee is happy to invite you to the 1st Young Professional Luncheon at HUMANOIDS!

Join us for a dynamic and engaging luncheon designed to empower the next generation of leaders in technology and engineering. This event provides a unique opportunity for IEEE Young Professionals to network with peers, industry experts, and thought leaders. Attendees will gain valuable insights into career development, emerging technologies, and strategies for professional growth. Enjoy a delicious meal while participating in interactive discussions and activities aimed at fostering innovation and collaboration. Don't miss this chance to build connections, share experiences, and be inspired to take your career to the next level.

This event has limited spots available. Registration required.

Women in Engineering (WiE) Lunch: Women at the Forefront of Humanoids - A First of Many WIE Luncheons

24 November at 12:30
Centre Prouvé, Room 104 (1st floor)

The IEEE RAS Women in Engineering Committee is happy to invite you to the 1st WiE Lunch at HUMANOIDS!

This event has limited spots available. Registration required.
Coffee and sweets will be served during this lunch!

Outreach

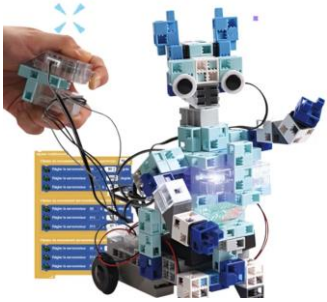
HUMANOIDS 2024 is excited to propose several outreach activities to the general public, particularly to the public of young students who can benefit from this unique opportunity to learn about robotics, see real robots in the exhibition and competition, and meet the researchers and robotics engineers working on these platforms.

	FRIDAY NOVEMBER 22ND	SATURDAY NOVEMBER 23RD	SUNDAY NOVEMBER 24TH	MONDAY NOVEMBER 25TH	TUESDAY NOVEMBER 26TH	WEDNESDAY NOVEMBER 27TH	THURSDAY NOVEMBER 28TH
EVENT	HUMANOIDS 2024			EUROBIN			
Outreach event @ Centre Prouvé		"Discover Robotics" Classes (6-14 yo) - registration open to general public		"Discover Robotics" Classes (6-14 yo) - for primary and secondary schools			
	Robot soccer tutorials (14+ yo)						
	Nao & LLM (18+ yo)						
		Guided tours for general public (0-99 yo)		Guided tour of robotics area - for primary and secondary schools			
	Discover a robotics conference (18+ yo)						
					GaroutzIA - Robotics and AI Theatre plays (12-18 yo) (in French)		
Outreach event @ Muséum Aquarium of Nancy	Soft Robotics - Conference for students (12-18 yo) by Christian Duriez - (in French)			Robotics, AI, Society - Conference for general public (16+ yo) by Lionel Obadia - (in French)			From intelligent machines to thinking machines - Cine-debate by Alain Dutech (12-18 yo) (in French)

The Outreach activities at HUMANOIDS 2024 mark the beginning of the International Robotics Week at Nancy: this is the name that is used for communication with the General Public. The Robotics Week groups the Outreach activities at HUMANOIDS 2024 and at the 1st euROBIN coopetition (annual event of the European project euROBIN – network of excellence in Robotics and AI). This is a unique opportunity for us to bring robotics closer to the young students and the society in general. The Inria center of the University of Lorraine and the City of Nancy are supporting the conference with an extensive communication campaign on every media support, transportation, magazines, etc., and some local shops in Nancy are running robotics-themed campaigns to help us reach out to the public.

Important information: all the people from the general public who are joining the conference venue to attend these activities will be wearing light blue vests. If you see people wearing this vest wandering around the conference without being in a group led by a member of our staff, please alert our staff and bring them immediately to the front desk.

K-12 Robotics Classes (6-14 yo)



This is a 1h30 class of “Introduction to robotics” adapted to young children who may have no to little background of robotics and programming. The class is given by *Codeurs en Herbe*, a young company that is already active in educational robotics in the town of Nancy. Their teaching method is based on visual programming language for the younger, then scratch for the older kids, together with a modular system made of cube bricks and electronics components that enable children to build different robots.

Format: 4 per day, on Saturday to Sunday
Target number of participants: 192

Robot Soccer (14+ yo)

This activity is executed by the team of researchers of the University of Bordeaux promoting the Robocup juniors: Gregoire Passault and Charles-Adrien Vlamynck. In the Aquitaine region, they have a huge outreach activity promoting robotics among children in schools.7

Format: 3h per session, twice a day, Friday to Sunday
Target number of participants: 144

Discover ChatGPT with NAO (18+ yo)

This activity is promoted and organized by United Robotics. They will demonstrate how to integrate LLMs into NAO:

1) Transform NAO into a scripted chatbot
2) Convert NAO into an LLM-powered chatbot (“Talk to ChatGPT”)
3) Enhance NAO's capabilities beyond speech: walking, joint control, and playing animations
4) Augment NAO's inputs beyond verbal commands: time, touch, vision, object detection…

Format: 4h per session, twice on Friday
Target number of participants: 40

Discover a Robotics Conference: Outreach Program Tickets for High School and University Students (18+ yo)

This is a discounted ticket that gives access to the conference for one day to students of high-schools and University. They can discover a robotics conference, attend poster and oral sessions, visit the exhibition and competition area. This is an exceptional opportunity to grow and inspire the students to continue their career in robotics!

One of their professors must endorse the application of the student or students’ group. Thanks to the IEEE Robotics and Automation Society, the first 100 tickets are free!

Format: Throughout the conference, 22-24 November.
Target number of participants: 100

Discover Soft Robotics: Outreach Conference by Christian Duriez (14-18 yo)

Soft robots, towards new machines – Les robots souples, vers de nouvelles machines

On Friday 22 at 13:30 only, Christian Duriez, Inria research director, is giving a public conference at the Amphitheater of the Museum Aquarium of Nancy about soft robotics. The conference is in French and targeting high school students. He will talk about robotics and introduce soft robotics and the challenges of this field.

Christian Duriez – Inria senior scientist and head of the team DEFROST.

Format: 1h30 of grand public conference, on Friday
Where: Amphitheater of the Museum Aquarium
Target number of participants: 200

General Public Visits: Guided Tours of Exhibition and Competition for the General Public

On Saturday 23 and Sunday 24, we have 30-minute guided tours to the exhibition and competition area for the general public. There are 8 tours per day, for 20 people per group. The tour is in French by default, English is also possible.

The guided tour of the exhibition and competition area is run by a professional scientific mediator and a volunteer scientific staff.

Format: 30 min visit and Q&A, on Saturday and Sunday.
Target number of participants: 320

After HUMANOIDS 2024: Outreach Continues at the 1st euROBIN Coopetition (Robotics Week)

Following the success of the euROBIN Week 2023 in Seville, the European Network of Excellence in Robotics and AI – euROBIN – has decided to co-locate the euROBIN Week 2024 in Nancy to associate it with HUMANOIDS 2024!

The conference participants will have the chance to visit the euROBIN exhibition and see how the European teams are preparing for their **coopetition** (collaborative competition), which will take place on November 25-28 in Centre Prouvé, just after the HUMANOIDS 2024 conference.

Robotics classes (6-14 yo) and Exhibition Visit

These are the same robotics classes of Humanoids 2024, but here they are mostly targeting schools (*écoles primaires & collèges*).

Format: 4 per day, from Monday to Thursday
Target number of participants: 384+

Conference: "Robot society, social robots, robots in society" (16+ yo)

Lionel Obadia, Professor of Anthropology at the University of Lyon 2, will be presenting a lecture entitled "**Robot society, social robots, robots in society**" on Monday 25 November at 7pm in the Cuénot amphitheater at the Aquarium Museum in Nancy. 200 participants are expected.

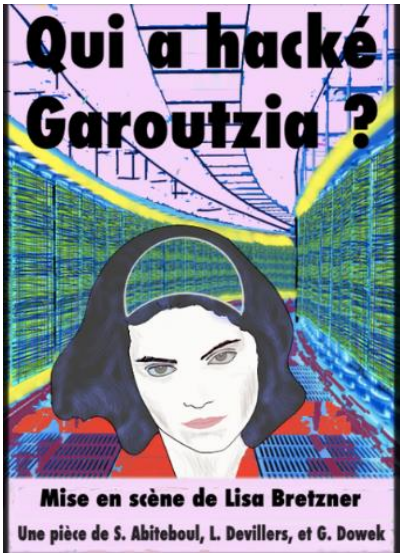
Abstract: *With the robotics revolution underway, much has been said, said again, debated and re-discussed about the place of robots in the midst of humans, the reasons, modalities and impacts of this 'robotisation' of the world, the type of tasks that machines with behavior should perform, the relationships that they should maintain with the men and women around them, the beliefs and ideas that they arouse in the latter... However, far from following the clear line of a development that considers that humans and their machines will necessarily end up 'forming society' together, this conference will provide an opportunity, on the basis of studies carried out personally and a review of the literature on social robots and technocultural imaginations, to take stock of the major issues linked to robots in human societies, by looking at their usefulness, but also their desirability and their uses, and, consequently, their 'social' or 'socialising' character.*

Format: Lecture, on Monday, at 19:00.
Where: Amphitheater of the Museum Aquarium
Target number of participants: 200

Robotics and AI Theatre Play (12+ yo)

GaroutzIA is the name of the robotics and AI Theatre play which will be played on November 26th in Centre Prouvé, for a public of 600 students of secondary schools and high schools. Combining robots, actors, humor and critical thinking, this play will pedagogically raise awareness to robots and its stakes.

***Who hacked Garoutzia? – by* Serge Abiteboul – Laurence Devillers – Gilles Dowek (12+ yo)**



Abstract: *A tragicomedy in four acts, recounting the successive lives of Garoutzia, a conversational agent, a bot of the future. Garoutzia, Botpower's domestic artificial intelligence, witnesses the death of its owners. A police investigation forces it to retrace the course of its digital memory and discover, through contact with humans, the pleasure of words, transgression, friendship, death...How can we apply the codes of burlesque and derision to deal seriously with the philosophical questions raised by the emergence of conversational machines? How do bots learn to imitate human emotions without ever feeling them? Can their fake empathy influence the actions of humans? And what is the role of the company that manufactures these robots? Three renowned computer scientists have decided to illustrate the questions raised by the relationship between humans and artificial intelligence in a play to reach a wider audience.*

Prof. Abiteboul will be present after the Plays to answer questions from the public

More info (French): https://cfeditions.com/garoutzia/ressources/dossier_production_theatre.pdf
Teaser video (French): https://youtu.be/yPVY8naq-Cs?si=iCLP059PaxdkdE0d

Format: Theatre, twice on Tuesday (morning and afternoon)
Where: Amphitheater of the Museum Aquarium
Target number of participants: 600 people

***Movie-debate / Ciné-débat* : "From intelligent machines to thinking machines / Des machines intelligentes aux machines pensantes" (14+ yo)**

Alain Dutech, Inria researcher at the Inria Center of the University of Lorraine, and Nicolas Dupuy (PhD in physics- chemistry, expert of science fiction) will present and moderate a ciné-débat conference "**From intelligent machines to thinking machines**" on Thursday 28 November at 2pm in the Cuénot amphitheater at the Aquarium Museum in Nancy. 200 participants are expected.

This format of conference-debate has been already successfully presented in other dissemination activities: using movie clips from emblematic science-fiction movies from the '50s till today, they can revisit the links between Humans and Machines, in particular robots.

Format: Movie-debate, on Thursday, at 14:00.
Where: Amphitheater of the Museum Aquarium
Target number of participants: 200

Competition

Competition Hours

The **humanoid and quadruped locomotion competition** will take place on November 23 from 10:00 to 17:00 and November 24, 2024 from 10.00 to 15:00.

Description

The **Humanoids 2024 Locomotion Competition** will challenge humanoid and quadruped robots to navigate a 15m corridor, overcoming static obstacles and, in some cases, carrying payloads. Both fully autonomous operation and teleoperated control are allowed. Depending on the race type, robots will face a variety of obstacles including storage boxes and a door. The fastest competitors to complete the task without falling will be declared the winners.

Program

- **Corridor Race 1: Biped Free Walk** Nov 23, 10:00–12:00
  Competitors must navigate the corridor, instructing their robots either via teleoperation or have them autonomously execute the task.
- **Corridor Race 2: Biped Static Obstacle Avoidance** Nov 23, 13:00–15:00
  Robots must navigate the corridor while avoiding static obstacles in the form of storage boxes that are known to the competitors.
- **Corridor Race 3: Biped Static Obstacles and Door** Nov 23, 15:00–17:00
  In addition to static obstacles, robots will face a door at the end of the corridor that they need to traverse in order to finish the race.
- **Corridor Race 4: Quadrupeds Static Obstacles** Nov 24, 10:00–12:00
  Quadrupeds will navigate the corridor while avoiding storage containers as obstacles.
- **Bonus Track: Static Obstacle with Payload** Nov 24, 13:00–15:00
  The bonus track extends on the corridor race as it requests bipeds to carry a parcel as payload in their arms, while quadrupeds may transport the parcel on their back.

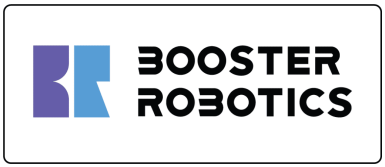
This competition tests both robotics capabilities and provides an opportunity for networking with experts and peers in the field. Whether competing or spectating, participants will have the chance to observe advanced robots and engage with the community next to the action.

Partners

Diamond

Platinum

Gold



Silver

Bronze

Exhibitors

Exhibition hours for the public:

Friday 22 November: 9:45 AM - 6:00 PM
Saturday 23 November: 9:00 AM - 6:00 PM
Sunday 24 November: 9:00 AM - 4:00 PM

List of Exhibitors:

Agile Robots

Biometrics France

Boardwalk Robotics

Booster Robotics

Delsys Europe

Enchanted Tools

Fourier

Franka Robotics

German Aerospace Center (DLR)

IMSystems

Istituto Italiano di Tecnologia (IIT)

Inria

Kollmorgen

Loria

LuxAI

Maxon

Nokov

Novanta

Pal Robotics

Pollen Robotics

Pôle Universitaire d'Innovation (PUI) Polaris

Prensilia

Resense

Synapticon

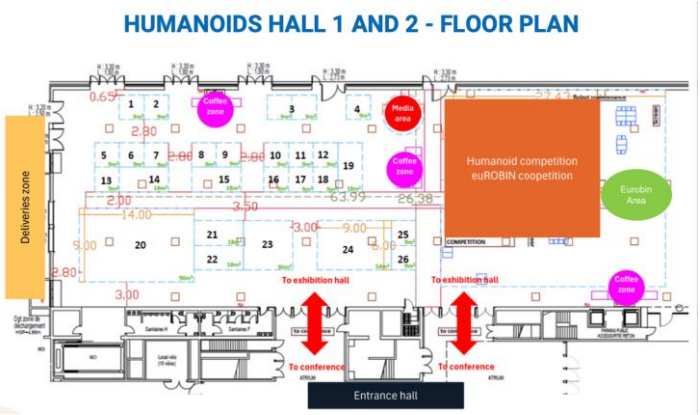
Technology Innovation Institute (TII)

Unitree

Wandercraft

Xsens / Movella

This list is up to date on October 21, 2024.



Childcare

Centre Prouvé, room 206

Free childcare for conference participants is available for the 3 days of the conference, for children aged 3+ years old. This activity is performed at the Conference Center Prouvé, where we rent a room for 3 days (room 106). This enables the parents to see the children when they wish. Lunch is included (lunchbox).

A company (Zack School by FormaPlume) specialized in multilingual daycare and summer camps with children is hired to carry out a Robotics Education program designed with the help of the General Chair and the Diversity Chairs.

During the three days of the conference, children will engage in playful activities inspired by robotics, build robot arms and hands with DIY kits, create new robots with Lego, study movement with a DIY paperboard humanoid robot, etc. They will also take the outreach class “introduction to robotics” by *Codeurs en Herbe* and will have an extensive guided tour of the exhibition and competition space where they will be able to see all the robots and ask questions.

At the end of the conference, they will receive a Humanoids 2024 training certificate of attendance.

Please note that the children will not visit the exhibition & competition during the coffee breaks, as the exhibition hall will be crowded. The planning of all activities, except for the robotics classes on Sunday at 1:30pm, can be adapted to the presence of the kids onsite and the parents' constraints.

Social events organized by the conference are not included and not designed for children.

Thanks to the support of the IEEE Robotics and Automation Society, we are pleased to offer the childcare participation fee to the children of the Humanoids 2024 conference participants who request it!

For parents with toddlers and newborns, we have organized a breastfeeding and baby changing area. Ask the registration desk at the entrance of the Conference Center for the keys and directions to this area.

Contact Information

General Inquiries

Sponsors and exhibitions:
humanoids2024-sponsors-exhibitors@inria.fr

Robotics competition:
humanoids2024-competition@inria.fr

Outreach:
humanoids2024-outreach@inria.fr

Registrations and payments:
humanoids2024-registration@inria.fr

Scientific program and paper submissions/presentations:
humanoids2024-pc@inria.fr

Local organization, the logistics, the staff, or volunteering:
humanoids2024-local-organization@inria.fr

Conference, including media, press, etc.:
humanoids2024-gc@inria.fr

Or speak to one of the many volunteers!

Emergency Information

Service	**Phone number** *+33 is the prefix for France*
Medical emergencies	112 or 15
Firefighters	112 or 18
Police	112 or 17
Poison centre	+33 383225050
SOS Medicine 24h/24h *a doctor will answer and may visit you if you need it*	3624 or +33 826465454 http://www.sosmedecins-nancy.com/
Medical centre for immediate care 42 Rue du 8 Mai 1945, 54270 Essey-lès-Nancy Open 8AM - 8PM	+33 383188367
Medical centre for night and weekend 31 Rue Lionnois, 54000 Nancy Open 8PM - 12AM	https://www.medecindegarde-nancy.fr/
Pharmacies at night	3237 www.3237.fr

Taxi Service

Nancy taxi service (available day and night)
2 Boulevard Joffre – 54000 Nancy

Tel: +33 3 83 37 65 37
Email: contact@taxis-nancy.com
Website: www.taxis-nancy.com

Abstracts and Biographies

Luis Sentis

The Point of Humanoid Robots

As the price of humanoid robots decreased to a historical minimum, the industrial sector feverishly debates about their productivity. What will be the killer App of humanoids be and where we will likely see them popping up? This keynote will delve into such market dynamics and technical questions regarding the symbiosis of the physical mechatronic embodiments of humanoids, new interfaces to teach them at scale, and their deployment in larger setups with the use of state-of-the-art cognitive architectures.

Bio

Luis Sentis is a Professor in Aerospace Engineering at UT Austin and the Chair of UT's Good Systems. He earned his Ph.D. in electrical engineering from Stanford University and was a La Caixa Fellow. At UT, he leads the Human Centered Robotics Laboratory, focusing on control, task and motion planning, human factors, and experimentation with humanoid robots. His research has been funded by ONR, NASA, NSF, USARMY, AFRL, DARPA, USSF, and companies in the industrial sector. He is also a founding member and innovation advisor for Apptronik Systems, a company focusing on industrial humanoid robots.

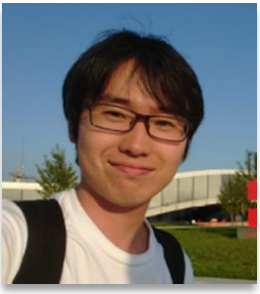
https://sites.utexas.edu/hcrl/

Kento Kawaharazuka

History and Future of Tendon-driven Musculoskeletal Humanoids

At JSK Robotics Laboratory, we have developed various humanoids, such as those for daily life support and disaster rescue, musculoskeletal humanoids that mimic the human body, and flying humanoids. In this keynote talk, I will focus on tendon-driven musculoskeletal humanoids and introduce the series of humanoids we have developed, such as Kenta, Kotaro, Kojiro, Kenzoh, Kenshiro, Kengoro, and Musashi. Additionally, I will present the Kangaroo robot, the jumping monopedal robot RAMIEL, the light-weight flexible manipulator SAQIEL, and the mobile tendon-driven robot Cubix, all of which utilize the advantages of tendon-driven mechanisms. Tendon-driven mechanisms are currently being incorporated into hands, manipulators, and leg systems to achieve quick, flexible, and delicate movements, and they are gaining popularity. I hope you will fully immerse yourself in their appeal.

Bio



Kento Kawaharazuka is a Project Assistant Professor of JSK Robotics Laboratory in the Department of Mechano-Informatics at the University of Tokyo, Japan. He received his B.E., M.S., and Ph.D. degrees in Mechano-Informatics from the University of Tokyo in 2017, 2019, and 2022, respectively. He was a Best Paper Award Finalist at Humanoids 2016 and 2022, and received the Best Oral Paper Award at Humanoids 2020. His research interests include musculoskeletal humanoids that closely mimic human anatomy, wire-driven robots, soft robotics, machine learning-based controls such as imitation learning, reinforcement learning, and predictive model learning, and real-world robot applications of foundation models including large language models and vision-language models.

https://haraduka.github.io/

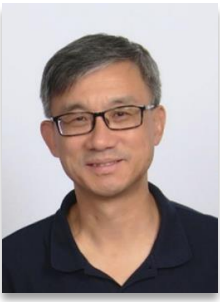
Michael Yu Wang

Rapid Rise of Humanoid Robots in China

At the World Robot Conference in August 2024 in Beijing, China, 27 humanoid robots were showcased, which are the most ever. They highlighted the rapid progress in this field and showed how they're setting new standards with potentials to interrupt and impact our work and lives. The advancement in machine learning and artificial intelligence is a major driver of the rapid rise of humanoid robots in China, as the developers are expecting a boom market for their future roles in industry, healthcare, education, and household assistance.

This talk will present an overview of China's current status in humanoid robots based on personal experience and academic collaborations. I will discuss the goals and plans of the government, the innovation strategy for global leadership, and the partnership between local governments, industry leaders, and research institutions, aiming to set China up to be a leader in the world of humanoid robotics. Still, China's humanoid robot industry is facing several challenges, including technological hurdles in perfecting AI and ensuring that these robots can effectively and safely work in real-world environments. International collaboration and open-source development are also crucial for driving innovation to make significant strides in this field for global benefits of humanity.

Bio



Michael Yu Wang is a Chair Professor and the Founding Dean of the School of Engineering of the Great Bay University, China. He has served on the engineering faculty at University of Maryland, Chinese University of Hong Kong, National University of Singapore, Hong Kong University of Science and Technology, and Monash University. He has numerous professional honors–Kayamori Best Paper Award of 2001 IEEE International Conference on Robotics and Automation, the Compliant Mechanisms Award-Theory of ASME 31st Mechanisms and Robotics Conference in 2007, Research Excellence Award (2008) of CUHK, and ASME Design Automation Award (2013). He was the Editor-in-Chief of IEEE Trans. on Automation Science and Engineering, and served as an Associate Editor of IEEE Trans. on Robotics and Automation and ASME Journal of Manufacturing Science and Engineering. He is a Fellow of ASME, HKIE and IEEE. He received his Ph.D. degree from Carnegie Mellon University.

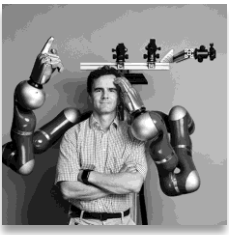
www.gbu.edu.cn

Jan Peters

Inductive Biases for Learning of Anthropomorphic Robots

Autonomous humanoid robots that can assist humans in situations of daily life have been a long-standing vision of robotics, artificial intelligence, and cognitive science. A first step towards this goal is to create robots that can learn tasks triggered by environmental context or higher-level instruction. However, learning techniques have yet to live up to this promise as only few methods manage to scale to high-dimensional manipulator or humanoid robots. In this talk, we investigate a general framework suitable for learning motor skills in robotics which is based on the principles behind many analytical robotics approaches. To accomplish robot reinforcement learning from just a few trials, the learning system can no longer explore all learnable solutions but has to prioritize one solution over others – independent of the observed data. Such prioritization requires explicit or implicit assumptions, often called 'induction biases' in machine learning. Extrapolation to new robot learning tasks requires induction biases deeply rooted in general principles and domain knowledge from robotics, physics and control. Empirical evaluations on a several robot systems illustrate the effectiveness and applicability to learning control on an anthropomorphic robot arm. These robot motor skills range from toy examples (e.g., paddling a ball, ball-in-a-cup) to playing robot table tennis, juggling and manipulation of various objects.

Bio



Jan Peters is a full professor (W3) for Intelligent Autonomous Systems at the Computer Science Department of the Technische Universität Darmstadt since 2011, and, at the same time, he is the dept head of the research department on Systems AI for Robot Learning (SAIROL) at the German Research Center for Artificial Intelligence (Deutsches Forschungszentrum für Künstliche Intelligenz, DFKI) since 2022. He is also is a founding research faculty member of the Hessian Center for Artificial Intelligence. He has led research groups on Machine Learning for Robotics at the Max Planck Institutes for Biological Cybernetics (2007–2010) and Intelligent Systems (2010–2021). Jan Peters has received the Dick Volz Best 2007 US PhD Thesis Runner-Up Award, the Robotics: Science & Systems - Early Career Spotlight, the INNS Young Investigator Award, and the IEEE Robotics & Automation Society's Early Career Award as well as numerous best paper awards. In 2015, he received an ERC Starting Grant and in 2019, he was appointed IEEE Fellow, in 2020 ELLIS fellow and in 2021 AAIA fellow.

https://www.ias.informatik.tu-darmstadt.de/

Justin Carpentier

Towards Fully Differentiable Control Architecture for Robotics: Simpler, Nimbler, Faster, Stronger

Over the past decades, optimization has emerged as a key enabler for many robotics applications, particularly humanoids and quadrupeds. While initial solutions largely relied on models, in today's data-driven landscape, it is becoming increasingly common to seek data-driven extensions to classical approaches. Differentiable control architectures propose a principled way to achieve this evolution.

In this keynote, I will highlight recent contributions towards this objective from the team I lead at Inria, notably our efforts to (i) lay the groundwork for the next generation of differentiable simulators for robotics and (ii) develop differentiable optimization solvers that are both fast and dependable. Hopefully, these contributions will catalyze the design of the next generation of AI-driven learning and control methods in robotics.

Bio

Justin Carpentier is a researcher at Inria and École Normale Supérieure, heading the Willow research team since 2023. He graduated from École Normale Supérieure Paris-Saclay in 2014 and received a Ph.D. in Robotics in 2017 from the University of Toulouse. He did his Ph.D. in the Gepetto team at LAAS-CNRS in Toulouse, working on the computational foundations of legged locomotion. In 2024, he received an ERC Starting Grant focusing on laying the algorithmic and computational foundations of Artificial Motion Intelligence. His research interests lie at the interface of optimization, machine learning, computer vision, simulation, and control for robotics, with applications ranging from agile locomotion to dexterous manipulation. He is also the leading developer and manager of widely used open-source robotics software, among them Pinocchio, ProxSuite, HPP-FCL, and Aligator.

https://jcarpent.github.io

Agnieszka Wykowska

The role of humanoid robots in cognitive neuroscience

Humanoid robots have recently received a lot of attention and enthusiasm in the robotics community and beyond. Indeed, with new technological advancements, they hold the promise to become our assistants in daily lives, as general-purpose machines. In this talk, however, I will focus on a different, less explored, way of using humanoids – as tools to understand human cognition. Humanoids can play a substantial role in the scientific understanding of human cognition, both through the construction of embodied models of cognitive mechanisms, and in the role of sophisticated apparatus in experimental paradigms. In this talk, I will present the work of our lab where we have examined how fundamental mechanisms of human cognition, such as attention, decision making or sense of agency, are modulated by the interaction with a humanoid. I will then demonstrate how results from such studies can be used in robot-assisted cognitive training for children with disabilities, highlighting the role of fundamental science in applied research and technology transfer.

Bio

Agnieszka Wykowska is the head of the unit “Social Cognition in Human-Robot Interaction” at the Italian Institute of Technology (IIT), in Genoa, Italy. She is also the Coordinator of the Center for Human Technologies, at the IIT. Her background is Cognitive Neuroscience (Master’s degree in Neuro-Cognitive Psychology from the Ludwig Maximilian University Munich in 2006). She obtained a PhD in Psychology (2008) from the same university. In 2016 she was awarded the ERC Starting grant “InStance: Intentional Stance for Social Attunement”. Between 2022 and 2024 she served in the role of President of the European Society for Cognitive and Affective Neuroscience (ESCAN). She is Editor-in-Chief of International Journal of Social Robotics. She is also board member of Association of ERC Grantees and a delegate to the European Research Area (ERA) Forum – an EU expert group shaping EU science policies. In 2023 she was awarded the Hans-Fischer Senior Fellowship from the Institute of Advanced Studies at the Technical University Munich to lead a research group “Human Cognition in Neuroengineering”.

https://www.iit.it/it/people/agnieszka-wykowska

Workshop Appendix

Workshop 1

Real-World Physical and Social Human-Robot Interaction

Type and Duration

Type: Workshop

Duration: full day

List of Organizers

Elmira Yadollahi, Assistant Professor, Lancaster University, United Kingdom (Primary Contact), e.yadollahi@lancaster.ac.uk

Ziwei Wang, Assistant Professor, Lancaster University, United Kingdom, z.wang82@lancaster.ac.uk

Parag Khanna, Doctoral Student, KTH Royal Institute of Technology, Sweden, paragk@kth.se

Angela Faragasso, Lead Researcher Engineer, Finger Vision Inc., Japan, angela.faragaso@fingervision.biz

Barbara Bruno, Professor, Karlsruhe Institute of Technology, Germany, barbara.bruno@kit.edu

Christian Smith, Associate Professor, KTH Royal Institute of Technology, Sweden, ccs@kth.se

Objective and Scope

As robots increasingly enter everyday settings—from homes to workplaces—the necessity for sophisticated human-robot interaction (HRI) capabilities becomes paramount. Traditional HRI systems often relied on a single mode of interaction, which could limit the robot's ability to understand and respond to human nuances effectively. These limitations are more

pronounced when the robots are developed and deployed in the real world. Interestingly, it seems academia and industry are tackling these issues differently. Nevertheless, recent research advancements such as multimodal HRI seek to overcome these limitations by integrating various sensory inputs such as visual, auditory, and tactile feedback, thus enabling robots to interpret and adapt to complex human behaviours and environments. The integration of these modalities presents significant challenges, including sensor fusion, context-aware computing, and the development of adaptive, user-centred interfaces that can handle diverse human expressions and intentions. Bridging between physical and social HRI research while filling the gaps between academia and industry could help navigate these complexities and overcome some of these challenges.

This workshop aims to convene leading scholars and practitioners to explore how real-world robotics application is tackled in physical HRI and social HRI and how these two fields could collaborate to develop robots that are truly fit to function in the real world. This workshop will highlight recent advancements in affective computing, multimodal interaction, tactile feedback, visual recognition, interaction patterns and social dynamics to create robots that can engage more naturally and effectively with humans in diverse environments. Building on the success of previous related workshops at renowned conferences such as ICRA and IROS, this session is anticipated to attract a broad audience, ranging from academic researchers and industrial practitioners to educators and policymakers. Participants will engage in a series of keynote presentations, interactive panels, demonstrations, and hands-on demonstrations, providing both foundational insights and innovative approaches to multimodal interaction. The workshop will also feature a call for papers, inviting contributions that address theoretical models, empirical studies, position papers, or state-of-the-art applications in human-robot interaction. Through this comprehensive format, the workshop will foster an inclusive dialogue aimed at shaping future collaborations between researchers in the two fields.

List of Topics

Topics of interest include, but are not limited to:

- Human performance assessment, human factors analysis and strategies
- Real-world applications and case studies of embodied intelligence in Physical/Social HRI
- Multimodal interaction and affective computing for Physical/Social human-robot interaction
- Bridging the gap between physical and social human-robot interaction
- Machine learning for multimodal human-robot interaction
- Multimodal behavioral perception in humans and behavioral generation in robots
- Whole body control for Humanoid robots
- Advances in Physical/Social HRI in industry and academia
- Ethics, Safety, and transparency of interacting with robots physically and socially

Expected attendance

Drawing upon our extensive history of organizing analogous workshops at ICRA in 2016, 2019, 2023 and 2024, IROS in 2019 - 2021, and NER in 2021, we anticipate that the proposed workshop will attract between 50 and 60 participants.

Invited Speakers

Physical HRI Researchers

- Katja Mombaur, KIT and Waterloo (TBD)
- Eiichi Yoshida, Tokyo University of Science, Japan (Confirmed)
- Enrico Mingo Hoffman, ISFP (Inria Starting Faculty Position) researcher in INRIA Nancy Grand-Est and LORIA, France (confirmed)

Social HRI Researchers

- Serena Ivaldi/ Quentin Rouxel, Inria Nancy - Grand Est, CNRS, Université de Lorraine, Villers-lés-Nancy, France (Confirmed)
- Maartje de Graaf (Utrecht University)
- Maya Cakmak or someone from her group (TBD)

Industry Researchers

- Francesco Ferro (PAL)
- Someone from Navel Robotics
- Someone from Unitree

Program Schedule

08:30 - 08:40	Introduction
08:40 - 09:10	Invited Speaker (20 + 10 Q/A) (Physical HRI researcher) (Gentiane Venture)
09:10 - 09:40	Invited Speaker (20 + 10 Q/A) (Social HRI researcher) (Serena Ivaldi/Quentin Rouxel or someone from their group)
09:40 - 10:00	Invited Speaker (20 + 10 Q/A) (Physical HRI researcher) (Eiichi Yoshida)
10:00 - 10:30	***Contributed Talks (2-3 talks)***
10:30 - 11:00	**Coffee Break**
11:00 - 12:30	**Panel on Why Should Physical and Social HRI Researchers Listen to each other more? (either from keynotes or new physical and social HRI researchers)**
12:30 - 14:00	**Lunch**
13:30 - 14:00	Invited Speaker (20 + 10 Q/A) (Social HRI researcher) (Maya Cakmak or someone from her group)
14:00 - 14:30	Invited Speaker (20 + 10 Q/A) (Industry researcher) (from Enchanted tools)
14:30 - 15:00	Invited Speaker (20 + 10 Q/A) (Industry researcher) (one of the panelists if they are interested)
15:00 - 15:30	**Coffee Break**
15:30 - 16:00	***Contributed Talks (2-3 talks)***
16:00 - 17:15	**Panel on How to reconcile Academia and Industry's approach to HRI? (Francesco Ferro (PAL), Someone from Navel, Academic 1 and Academic 2)**
17:15 - 17:30	Concluding remarks

Workshop 2

Human-Robot-Avatar Interaction and Collaboration: Enhancing robot's-avatar's proactive social capabilities

Type and Duration

Type: Workshop

Duration: Half day

List of Organizers

- Dr. Anais Garrell, Institut de Robòtica i Informàtica Industrial (IRI), CSIC-UPC, anais.garrell@upc.edu (primary contact)
- Dr. Gustavo Garcia, Ritsumeikan University, garcia-g@em.ci.ritsumei.ac.jp
- Prof. Alberto Sanfeliu, Institut de Robòtica i Informàtica Industrial (IRI), CSIC-UPC, alberto.sanfeliu@upc.edu
- Prof. Yukiko Nakano, Seikei University, y.nakano@st.seikei.ac.jp
- Prof. Takayuki Kanda, Kyoto University, kanda@i.kyoto-u.ac.jp
- Prof. Tadahiro Taniguchi, Kyoto University, taniguchi@i.kyoto-u.ac.jp

Objective and Scope

Significant progress in AI and robotics improves the performance of semi-autonomous robots, which partially work autonomously and are partially teleoperated by human users from a distance. Therefore, such teleoperated robots work as avatar (alter ego) of the robot operator, and provide enormous possibilities to expand the operator's physical, cognitive, and perceptual capabilities assisted by AI technologies. To accomplish such Human-Robot-Avatar interaction, avatar robots are required to understand and predict the remote user's intention and proactively plan and coordinate the robot's behaviors autonomously.

One key factor for the success of such approaches will be the ability of these robots to actually work and interact with humans and avatars in a way that is effective, just as other humans would do. And one of such abilities is that of adaptation to the humans, their failures, reactions, and mental states. Therefore, anticipating and predicting such events will allow robots to proactively adapt to the situation, preventing failure, and becoming more helpful than a mere automaton performing a simple task and acting as a real co-worker/assistant.

The goal of this workshop is to provide an opportunity for researchers specializing in autonomous cognitive and developmental robots and those in social robots and human-robotinteraction to come together and discuss how to develop human-centered semi-autonomous teleoperated robots to realize a human-robot symbiotic society.

We believe the topic of the workshop is quite timely and relevant. In recent years, we have seen an increase in research towards Human-Robot Collaboration and Interaction and robotic assistance (physical and social), aiming to integrate robots into our daily lives, both at work and at home, and industrial partners have shown increasing interest in those.

List of Topics

- Algorithms for Cybernetic Avatars
- Ethical considerations for Human-Robot-Avatar Interaction
- Predictive modeling of human intentions for avatar behavior
- Motion planning and coordination in collaborative tasks with avatars
- User studies for evaluating avatar-human interaction
- Enhancing transparency and explainability in AI for avatars
- Benchmarking and use cases for understanding avatar explainability
- Social dynamics and empathy in avatar-mediated interactions
- Human-centered design approaches for avatar development
- Novel applications of cybernetic avatars in real-world scenarios with ethical considerations

Program

- 9:00-9:15 Welcome and introduction
- 9:15-9:40 Prof. Alberto Sanfeliu, Universitat Politècnica de Catalunya
- 9:40-10:05 Prof. Rachid Alami, LAAS-CNRS
- 10:05-10:30 Prof. Christian Becker-Asano, Stuttgart Media University
- 10:30-11:00 Coffee break (in Exhibition & Competition Area)
- 11:00-11:25 Prof. Yiannis Demiris, Imperial College London
- 11:25-11:50 Invited speaker 5
- 11:50-12:30 Prof. Hiroshi Ishiguro, Osaka University

URL

https://www.iri.upc.edu/workshops/hra24//index.html

Workshop 3

Designing Interactive Humanoids: Learning Tasks through Interaction with Humans

Daehyung Park, Jaeheung Park, Tapomayukh Bhattacharjee, Daniele Pucci, Giulio Romualdi

URL for the workshop:

https://humanoids-ws-2024.github.io/

Objectives

The workshop aims to discuss the development of next-generation humanoids designed to learn tasks through physical and social interactions with humans. The next humanoids are expected to perform diverse tasks with human-level skills, such as manipulation, assembly, and delivery, in various environments. However, despite having the physical capabilities for these tasks, programming the robots to execute them remains highly challenging. One potential approach involves designing humanoids that can learn tasks by communicating with humans through both verbal and non-verbal methods. This workshop will explore strategies to achieve this goal, in various aspects.

Topics of interest

- **Human-Robot Communication:** how can robots understand human intent or instruction for effective task completion? This involves verbal and non-verbal communication using diverse modalities and recent advancements in large models such as large multi-modal models (LMM).
- **Shared/Collaborative Control:** how can robots learn task skills from human interactions? This can be achieved by observing

multimodal human behaviors including kinesthetic teaching and visual demonstrations, toward the construction of foundation models.

- **Trusted Design:** how can we ensure robots are reliable and robust for physical-social collaboration with humans? These designs are to assist or substitute humans while ensuring safety in human-robot collaboration.

Invited Speakers

- "Learning From Demonstration Like a Juicer: Squeezing Every Last Drop out of Human Input", Oliver Brock (confirmed), Technical University Berlin (Germany)
- "ergoCub humanoid robot journey from teleoperation to autonomy", Daniele Pucci (confirmed), Italian Institute of Technology (Italy)
- "Interaction with different robots: the human perceptions and expectations", Yue Hu (confirmed), The University of Waterloo (Canada)
- "Deep reinforcement learning for contact-rich non-prehensile manipulation", Beomjoon Kim (confirmed), KAIST (S. Korea)
- TBD, Nadia Figueroa (confirmed), University of Pennsylvania (USA)

Program

Time	Talk
13:30 – 13:45	Introduction by Dr. Daehyung Park
13:45 - 14:15	Invited talks by Dr. BeomJoon Kim
14:15 - 14:45	Invited talks by Prof. Oliver Brock
14:45 - 15:00	Spotlight Talks
15:00 – 15:30	Coffee Break + Poster Session
15:30 – 16:00	Invited talks by Dr. Yue Hu
16:00 – 16:30	Invited talks by Dr. Daniele Pucci
16:30 – 17:00	Invited talks by Dr. Nadia Figueroa

Organizers

Park, Daehyung
Korea Advanced Inst. of Science and Technology,
291 Daehak-ro Building E3-1, Yuseong, Daejeon, Republic of Korea

Park, Jaeheung
Seoul National University,
1 Gwanak-ro, Gwanak-gu, Seoul, Republic of Korea

Bhattacharjee, Tapomayukh
Cornell University,
Ithaca, NY, United States

Pucci, Daniele
Italian Institute of Technology,
Via Morego, 30, Genova, Italy

Romualdi, Giulio
Italian Institute of Technology,
Via Morego, 30, Genova, Italy

Contact

D. Park
daehyung@kaist.ac.kr

Workshop 4

Human Movement Modeling for Human-Robot Interaction

Organizers: Pauline Maurice, Charles Pontonnier, François Bailly, Vincent Padois

URL for the workshop:

https://project.inria.fr/hummodel2024humanoids/

Objectives

This workshop addresses the topic of the (bio)mechanical simulation of human-robot systems. These simulations are central to the development and analysis of devices such as collaborative robots, exoskeletons, prostheses or, more generally, adapted workstations that should provide appropriate assistance for humans in all phases of their life. Yet, the existence of such simulators raises several scientific challenges ranging from multi-contacts physics, closed kinematic chains, free-floating systems, human actuation models, human motion models, representation of human populations, soft tissues modeling, passive and active mechanisms, robot control models or human motion analysis. On these topics, robotics and biomechanics share common challenges. We believe that both communities can strongly benefit from exchanging on their most recent advances and tools, as well as discussing the future challenges. This workshop will therefore bring together experts in biomechanics, robotics and physical simulation in order to foster fruitful and multi-disciplinary discussions. By providing a platform for top researchers from these communities to share their work, we aim to inspire cross-discipline collaborations and motivate the use of more integrated research approaches that are needed for the development of human-centered robotic assistance in real-world applications.

The workshop consists of 6 invited talks, an interactive session with presentations of selected contributions (posters and demos) preceded by a spotlight session, and a panel discussion.

Topics of interest

- Human musculoskeletal and neuromechanical modeling
- Physiology and biomechanics of human movement
- Human movement simulation and optimal synthesis
- Model-informed human-robot collaboration
- Data-driven human modeling
- Exoskeletons and wearable robots
- Physical human-robot collaboration

Invited Speakers

- Katja Mombaur (confirmed), Karlsruhe Institute of Technology (Germany)
- Justin Carpentier (confirmed), INRIA Paris (France)
- Nasser Rezzoug (confirmed), University of Poitiers (France)
- Ajay Seth (confirmed), TU Delft (Netherlands)
- TBD

Program

Time	Talk
8:30 – 10:00	Talk 1 + Talk 2
10:00 - 10:30	Coffee Break
10:30 - 12:30	Talk 3 + Interactive Session
12:30 - 13:30	Lunch Break
13:30 – 15:00	Talk 4 +Talk 5
15:00 – 15:30	Coffee Break
15:30 – 17:30	Talk 6 + Panel Discussion
17:30	End

Organizers

Pauline Maurice
CNRS – LORIA, Nancy, France

Charles Pontonnier
ENS Rennes – IRISA, Rennes, France

François Bailly
INRIA Montpellier, France

Vincent Padois
INRIA Bordeaux, France

Contact

Pauline Marice
pauline.maurice@loria.fr

Workshop 5

Designing Humanoids: How much should we learn from humans?

Organizers: Nertinger, Peper, Krebs, Das, Huber

URL for the workshop:

Designing Humanoids

Objectives

Integrating humanoid robots into everyday life is rapidly evolving, driven by advances in artificial intelligence, machine learning, and robotics. However, to be accepted, humanoids must keep up with human capabilities. Considering the overwhelming complexity of the human ability to perform motions and social interactions, the challenge of designing such sophisticated (social) entities is evident.

This workshop brings together researchers, engineers, ethicists, and industry professionals to examine situations where human behaviors, such as movements, (non-)verbal communication, and ethical implications, are considered the gold standard for imitation. It explores when emulating humans is optimal and when it may not be conducive, especially in scenarios where robots surpass human capabilities.

Topics of interest

- Topic 1 on Humanoid robots learning from human behaviors and interactions.
- Topic 2 on state-of-the-art data collection methods and recent datasets.
- Topic 3 on learning motion policies for robot embodiments using human motion data.
- Topic 4 on achieving and quantifying human likeness in humanoid robots.
- Topic 5 on ethical issues in human data collection for humanoid robot design

Invited Speakers

- “Frugal learning of whole-body manipulation skills from human demonstration”, Sylvain Calinon (confirmed), Idiap Research Institute/EPFL (Switzerland)
- “Control in Humans and Robots: Benefits and Boundaries”, Gentiane Venture (confirmed), University of Tokyo (Japan)•
- “Emotion simulation and expression in Human-Android interaction in Germany”, Christian Becker-Asano (confirmed), Stuttgart Media University (Germany)
- “Stability and Predictability in Complex Object Control – A Task-Dynamic Approach”, Dagmar Sternad (confirmed), Northeastern University (USA)
- “Learning and Transferring Knowledge from Humans to Humanoids”, Tamim Asfour (confirmed), KIT (Germany)
- “Why Humanoid Robotics Are Key to Mars Exploration and How They Will Empower Astronauts”, Daniel Leidner (confirmed), DLR (Germany)

Program

Time	Talk
9:00 – 9:15	Welcome & Intro
9:15 – 10:45	Talks of Field 1: Decoding Human Motion and Control: Insights and Methods for Learning from Human Behavior in Robotics
10:45 – 11:15	Coffee Break
11:15 – 11:45	Panel Discussion of Field 1
11:45 – 12:15	Talks of Field 2: Shaping Human Likeness in Humanoids: Ethical Implications and Methods for Quantification
12:15 – 13:15	Lunch Break
13:15 – 13:45	Talks of Field 2
13:45 – 14:15	Panel Discussion of Field 2
14:15 – 14:45	Talks of Field 3: Human Motion and Behavior Transfer: Examples of Humanoid Implementation
14:45 – 15:15	Coffee Break
15:15 – 16:15	Talks of Field 3
16:15 – 16:45	Panel Discussion of Field 3

Organizers

Nertinger / Simone
Munich Institute of Robotics and Machine Intelligence (MIRMI) – Technical University of Munich (TUM),
Bahnhofstraße 37, 82467 Garmisch-Partenkirchen, Germany

Peper / Kim Kristin
Munich Institute of Robotics and Machine Intelligence (MIRMI) – Technical University of Munich (TUM),
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Krebs / Franziska
High Performance Humanoid Technologies (H²T), Karlsruhe Institute of Technology (KIT),
Adenauerring 12, 76131 Karlsruhe, Germany

Das / Neha
Chair of Information-oriented Control (ITR), Technical University of Munich (TUM),
Barer Straße 21, 80333 Munich, Germany

Huber / Meghan E.
Department of Mechanical and Industrial Engineering, University of Massachusetts Amherst,
121 Presidents Dr, Amherst MA 01003, United States of America

Contact

Nertinger
simone.nertinger@tum.de

Workshop 6

Towards general-purpose robots: connecting generative artificial intelligence to humanoids

Type and Duration

- Type: Workshop
- Duration: half day

List of Organizers

- Jean-Baptiste Mouret (Inria) — jean-baptiste.mouret@inria.fr [Primary contact person]
- Fredrik Heintz (Linköping University, Sweden)
- Philip Piatkiewicz (ADRA)

Objective and Scope

General-purpose robots are machines that could perform virtually any task given simple instructions (e.g., verbal instructions). Up to a few years ago, these robots were mostly considered to be out of reach, often because of the lack of "common sense" displayed by the planning and natural language processing algorithms.

Recent advances in Generative AI, including Large Language Models (LLMs), Visual Language Models, and Diffusion methods, are making this vision increasingly attainable. Models such as ChatGPT demonstrate the ability to interpret and respond to diverse queries from text or images, proposing relevant answers and plans. However, linking such models to actions or control is an open challenge.

For these advanced AI models to be effectively utilized in robotics, the robots themselves must possess general-purpose capabilities. Humanoid and quasi-humanoid robots (e.g., bimanual torsos on wheels, centaur-like configurations) are particularly well-suited for this role: their versatility

allows them to perform a wide range of tasks in environments that are designed for humans.

The potential synergy between generative AI and humanoid robots presents an exciting avenue for research and industry that is gaining significant attention within the scientific community, with various research teams exploring multiple approaches, both with and without training specific components, and leveraging language or visual language models.

This workshop aims to foster a comprehensive dialogue among multi-disciplinary research areas (e.g. AI, data, robotics), providing a platform to share insights, methodologies, and visions for the future of humanoid robotics powered by generative AI. This is why the program balances speakers from academia, policy, and industry. In addition, we will circulate a call for contributions for short presentations by PhD students and post-docs if their work combines Generative AI and Humanoids.

The discussions in the workshop will contribute to the development of a European industrial strategy toward general-purpose robotics within the AI, Data and Robotics Association (ADRA) that is co-organizer of the workshop.

The AI, Data and Robotics Association (Adra, asbl) was founded in 2021 as the private side of the European Partnership on AI, Data and Robotics that will run from 2021 - 2028 and mobilises 1.3B Eur of European public funding, matched with 13B Eur of private investments. This Partnership is the European focal point for AI, Data and Robotics, and the entry point for organisations willing tocollaborate with the European Commission to shape the synergies between these technology domains in future applications and services for European Industry and society. Last June 2024, Adra published a Policy paper and Technology Roadmap on “GenAI and Robotics 4EU”, which will be the basis for future investments.

The workshop at Humanoids 2024 is part of a series co-organized by ADRA, with other workshops at the ERF (for example).

Financial support by ADRA/ADRA-E: registration to the workshop day for the invited speakers

List of Topics

- Generative Arti cial Intelligence
- Large Language Models
- Visual Language Models
- Policy
- General-purpose robots

Expected attendance

This is the first iteration of this workshop at IEEE Humanoids, but ADRA organized similar workshops at ERF, which were well attended. The workshop is about a “hot topic” for the robotics community, which generates wide interest and curiosity; therefore, we expect a large attendance.

The (short) policy presentation is focused on European policy, but (1) many attendees will be European, and (2) many researchers will be curious to understand Europe’s vision on this topic.

Invited Speakers (all confirmed)

- Edward Johns, Imperial College, https://profiles.imperial.ac.uk/e.johns [academic]
- Christophe Cerisara, CNRS, https://members.loria.fr/CCerisara/ [academic]
- Catherine Simon, French General Secretary for Investment (SGPI) [policy]
- Thibauld Jongen, ADRA & founder of Generative Robotics [industry]
- We are contacting guests for the panel discussion

Preliminary program

Each time slot includes time for questions and discussion. Please check the official website for the up-to-date program: https://adr-association.eu/events/adra-cross-community-workshop-towards-general-purpose-robots-connecting-generative

14:00-14:05	Introduction (JB Mouret)
14:05-14:30	Academic Presentation #1: Working with Large Language Models: Challenges and Solutions — Christophe Cerisara (LORIA, CNRS)
14:30-14:45	Policy Presentation: Technology Roadmap for Europe and Beyond — Catherine Simon
14:45-15:00	Industry Presentation: Replacing Manual Work in Manufacturing with Safe, Dexterous, and Intelligent Robots — Thibauld Jongen (Founder, Generative Robotics)
15:00-15:30	Coffee break
15:30-16:15	Academic Presentation #2: Connecting Generative AI and Robotics — Edward Johns (Imperial College)
16:15-16:30	Statements by the panel guests (guest list to be confirmed)
16:30-17:45	Panel Discussion (Moderator: Gregorio Ameyugo (CEA, ADRA-e))

Workshop on Humanoid Soccer Robots

Website

https://whsr-2024.github.io/

Type and Duration

Type: Workshop

Duration: full day.

List of Organizers

- Main contacts:
  - Mélodie Daniel (melodie.daniel@u-bordeaux.fr)
  - Grégoire Passault (gregoire.passault@u-bordeaux.fr)
  - University of Bordeaux, France
- Alessandra Rossi (a.rossi@herts.ac.uk)
  - University of Hertfordshire, UK
- Sven Behnke (behnke@cs.uni-bonn.de)
  - University of Bonn, Germany

Objective and Scope

Humanoid robotics has seen significant advancements in recent years, with notable improvements in both hardware and software capabilities. Off-the-shelf actuators, components, and robotic platforms like Unitree H1, Nao, NimBro, and Robotis-OP3 are becoming increasingly accessible to researchers. Despite these advancements, many challenges remain in achieving robust locomotion, localization, and navigation in complex environments. The dynamic and adversarial nature of soccer makes it an ideal testbed for these challenges.

This workshop aims to gather the humanoid robotics research community, particularly those involved in the RoboCup competition, which aspires to

field a robotic team capable of competing with human soccer players by 2050[1]. The RoboCup challenge has fostered a dynamic, multidisciplinary community.

The full-day program will feature invited talks, contributed presentations, and a panel discussion, covering high-level topics such as locomotion, perception, and localization, as well as advances in artificial intelligence with an emphasis on open-source and open-hardware approaches. Moreover, our workshop emphasizes the community's strong focus on advancing humanoid robotics platforms through detailed considerations in low-level design and prototyping, encompassing embedded systems, mechanics, simulation, etc. By focusing on these aspects, we aim to enhance the capabilities of humanoid robots.

List of Topics

- Humanoid robots prototyping,
- Motion planning and control,
- Perception,
- Localization,
- Autonomous decisions,
- Machine learning for robotics.

[1] https://www.robocup.org/a_brief_history_of_robocup

Expected attendance

In the event of that workshop, the following RoboCup research teams expressed their interests, and are very likely to attend and give a presentation. Contact names are given for reference.

- Kid Size
  - Hamburg Bit-Bots (Jasper Güldenstein, University of Hamburg, Germany)
  - Nubots (Thomas O'brien, University of Newcastle, Australia)
  - WF Wolves (Reinhard Gerndt, Ostfalia, Germany)
  - TH-MOS (Mingguo Zhao, Tsinghua University, China)
  - Rhoban (Grégoire Passault, University of Bordeaux, France)
- Adult Size
  - Nimbro (Sven Behnke, University of Bonn, Germany)
- SPL (Nao)
  - NomadZ (Filippo Spinelli, ETH Zurich)
  - B-Human (Tim Laue, University of Bremen, Germany)

An additional call will be made in the scope of the league, which may attract submissions from other competitors.

Invited speakers and general presentations (less specific to RoboCup) can be grouped over half a day (morning or afternoon) to be more accessible to external researchers.

Invited Speakers

In the scope of machine learning, the following invited speakers might give a talk in the workshop. They have both **confirmed that they could give a presentation** at the workshop:

- Antonin Raffin, German Aerospace Center (DLR)
  - The main contributor to Stable Baselines 3 / SBX, famous implementations of Reinforcement Learning algorithms in Python - https://araffin.github.io/
- Rémi Cadene, HuggingFace
  - HuggingFace is an Artificial Intelligence company, currently developing LeRobot, an open-source framework for end-to-end learning robotics skills - https://github.com/huggingface/lerobot

Workshop 8

Can we build Baymax? Part IX. Learning and Data Collection for Skillful Humanoid Robots

http://www.baymax.org/

Type and Duration

Type: Workshop

Duration: Full Day

List of Organizers

Main organizers (primary contact)

- Joohyung Kim (University of Illinois Urbana-Champaign, USA), joohyung@illinois.edu
- Jinoh Lee (German Aerospace Center, Germany), jinoh.lee@dlr.de

Co-organizers

- Alex Alspach (Toyota Research Institute, USA), alex.alspach@tri.global.com
- Christopher Atkeson (Carnegie Mellon University, USA), cga@cs.cmu.edu
- Katsu Yamane (Path Robotics, USA), katsu.yamane@gmail.com

Tentative Workshop Schedule

08:30	Registration opens
09:00	Welcome and Introduction
10:30 - 11:00	Coffee break and Poster Session*
11:00 - 12:30	Workshop
12:30 - 13:30	Lunch
13:30 - 15:00	Workshop
15:00 - 15:30	Coffee break and Poster Session*
15:30 - 17:30	Workshops
18:00	End of the day (Conference center will close)
18:30	Welcome Reception @ Town Hall

Objective and Scope

This will be the 9th “Can we build Baymax?” workshop, titled “Part IX. Learning and Collecting Data Collection for Skillful Humanoid Robots”. Since our first workshop in 2015, the series has taken place at the IEEE-RAS International Conference on Humanoid Robots every year. This workshop focuses on learning and collecting data on human motions, skills, and tasks for humanoid robots. Baymax, from Disney's "Big Hero 6," is an inflatable healthcare robot capable of walking, learning new skills, and physically interacting with people. While building such a robot in the real world is challenging, our workshop will bring together researchers to discuss related topics. This time, we will highlight efforts in learning from demonstration, teleoperation, motion retargeting, motion/skill/task data collection, foundation models, and scaling, enabling robots to robustly perform real-world tasks and interactions.

List of Topics

- Learning by Demonstration
- Imitation Learning
- Teleoperation systems
- Motion/skill/task data collection
- Foundation models for real-world interactions

Expected attendance

This workshop series has consistently attracted the largest audiences among workshops at past Humanoids conferences, with attendance ranging from 50 to 100 people, depending on the room size.

Invited Speakers

- Robert Griffin, IHMC and Boardwalk Robotics (confirmed)
- Dana Kulic, Monash University (confirmed)
- Unitree (confirmed)
- Tesla (in conversation)
- Guanya Shi, CMU (in conversation)
- And several humanoid companies