

IEEE RCAR 2026

IEEE International Conference on Real-time Computing and Robotics

Savoy Seychelles Resort & Spa, Seychelles,

August. 15-21, 2026

CONFERENCE DIGEST



Organizers

Institute of Electrical and Electronics Engineers

IEEE Robotics and Automation Society

Shanghai Jiao Tong University

Shenyang Institute of Automation, Chinese Academy of Sciences



Welcome

The 2026 IEEE International Conference on Real-time Computing and Robotics (IEEE RCAR 2026) will take place from August 15 to August 21, 2026, in Seychelles. The conference provides an international forum for researchers, engineers, and practitioners to present the latest advances in robotics, real-time computing, intelligent systems, perception, control, and related applications.

Seychelles — meaning "the islands of seashells" — is a radiant Indian Ocean paradise. Located about 1,500 km east of mainland Africa, the archipelago unfolds in a panorama of turquoise lagoons, sculpted granite peaks, and soft white-sand beaches framed by lush tropical forests. Influenced by African, French, and Creole heritage, Seychelles welcomes visitors with colourful colonial streets, lively markets filled with spices and fresh fruit, and a warm, easygoing island rhythm.

RCAR 2026 aims to provide participants with a high-quality technical program and a memorable international exchange experience, set against world-renowned snorkelling and diving, protected marine parks, rare birds and giant tortoises, vibrant Creole cuisine, and a strong commitment to eco-friendly tourism.



Hao Liu
General Chair
Shenyang Institute of Automation, CAS



Zhe Liu
General Chair
Shanghai Jiao Tong University



Yue Wang
Program Chair
Zhejiang University



Yufeng Yue
Program Chair
Beijing Institute of Technology

2026 IEEE International Conference on Real-time Computing and Robotics

Organizers:

Institute of Electrical and Electronics Engineers

IEEE Robotics and Automation Society

Shanghai Jiao Tong University

Shenyang Institute of Automation, Chinese Academy of Sciences



Organizing Committee

Advisory Council

Yunhui Liu The Chinese University of Hong Kong

General Chairs

Hao Liu Shenyang Institute of Automation, CAS
Zhe Liu Shanghai Jiao Tong University

General Co-Chairs

Ning Sun Nankai University
Zaojun Fang Ningbo Institute of Materials Technology and Engineering, CAS

Program Chairs

Yue Wang Zhejiang University
Yufeng Yue Beijing Institute of Technology

Program Co-Chairs

Yongming Yang Shenyang Institute of Automation, CAS
Hang Zhong Hunan University
Andong Liu Zhejiang University of Technology

Organizing Chairs

Xinhu Zheng The Hong Kong University of Science and Technology (Guangzhou)
Chaoqun Wang Shandong University
Zhijie Liu University of Science and Technology Beijing

Awards Chairs

Yunhui Liu The Chinese University of Hong Kong
Danwei Wang Nanyang Technological University

Publicity Chairs

Qingkai Yang	Beijing Institute of Technology
Ruochen Tai	Huazhong University of Science and Technology
Jin Wu	University of Science and Technology Beijing
Shaowei Cui	Institute of Automation, CAS
Changhao Chen	The Hong Kong University of Science and Technology (Guangzhou)
Chao Yu	Tsinghua University

Publications Chairs

Zhidong Wang	Chiba Institute of Technology
Liang Li	Zhejiang University
Weinan Chen	Guangdong University of Technology
Yansong Tang	Tsinghua Shenzhen International Graduate School
Rui Chen	Tsinghua University
Qi Ye	Zhejiang University

Local Arrangement Chairs

Betty-Mai Sofa	University of Seychelles
Haojian Lu	Zhejiang University

Financial Chairs

Lijun Han	Shanghai Jiaotong University
Shumei Yu	Soochow University

Conference Information

The 2026 IEEE International Conference on Real-time Computing and Robotics (IEEE RCAR 2026) will take place from August 15 to 21, 2026 at Savoy Seychelles Resort & Spa, Beau Vallon, Mahé, Seychelles. The objective of this conference is to provide a forum for researchers in robotics and real-time computing to share the latest results and explore the opportunity for research collaboration. With wide applications of robots in industry and service sectors, real-time computing plays one of the major roles in various topics in robotics, including real-time control, human-robot interactions, sensor perception and fusion, robot intelligence, etc. The scope of RCAR 2026 covers research, development, and applications in the dynamic and exciting areas of real-time computing and robotics.

Language

The official language of the conference is English.

Conference Date and Venue

- Date: August 15 to 21, 2026
- For oral presentation

Venue: Savoy Seychelles Resort & Spa
 Conference Room: Amirantes Ballroom
 Address: Beau Vallon, Mahé, Seychelles
 Website: <https://savoy.sc/about/>
- For video presentation:

We will use Tencent VooV Meeting as meeting software, usage is as follow:

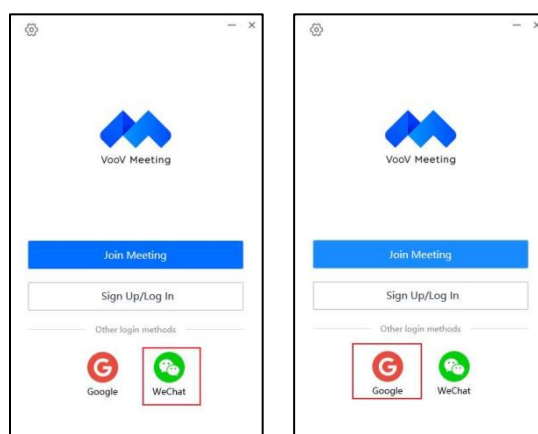
* Chinese authors please use this link to download Tencent VooV Meeting, and use your WeChat account. <https://meeting.tencent.com/download/>

* For international authors:

1. Please click here to download Tencent VooV Meeting:

<https://voovmeeting.com/download-win.html?from=1002&fromSource=1>

2. Then choose your favorite way to log in.



3. Sign up. Choose your primary location and date of birth.

Sign Up

Primary Location

United States

Please select the region/country where you are primarily located.

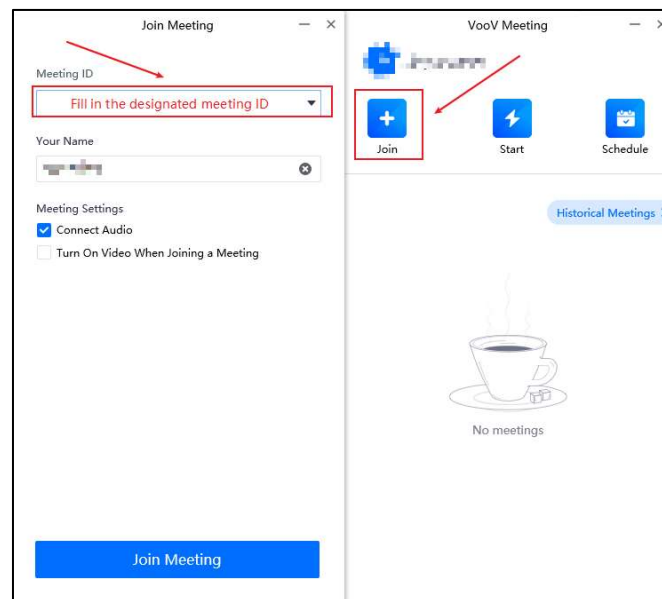
Date of birth

Select date

Please enter you date of birth to optimize your VooV Meeting experience.

4. Verify your phone number.

5. Join in the meeting. Please attend the designated meeting according to the meeting ID on the program schedule.



Seychelles Travel Guide



● About Seychelles

Seychelles is an island nation in the Indian Ocean, widely recognized for its beaches, granitic landscapes, marine environment, tropical vegetation, and relaxed island atmosphere.

The main international gateway is **Mahé**, where the capital city **Victoria** and Seychelles International Airport are located. From Mahé, participants may also explore nearby islands such as **Praslin** and **La Digue** before or after the conference.

Gateway: Seychelles International Airport (SEZ), Mahé Island

Capital: Victoria, located on Mahé Island

Experience: Beaches, forests, marine parks, and island culture

Planning: Early flight and hotel booking is recommended

● Places to Explore

■ Victoria and Mahé Island

Victoria is the capital of Seychelles and a practical starting point for understanding local life. Visitors may explore markets, small city landmarks, nearby beaches, and mountain routes across Mahé Island.



■ Vallée de Mai, Praslin

Vallée de Mai is one of Seychelles' best-known natural sites and is associated with the endemic **Coco de Mer palm** and a distinctive palm forest environment.

Located on Praslin Island, this UNESCO World Heritage Site is a popular destination for visitors interested in nature and unique island ecosystems.



■ La Digue and Anse Source d'Argent

La Digue is often associated with beaches, granite rock formations, bicycles, and quiet coastal scenery. Anse Source d'Argent is one of the most recognizable beach landscapes in Seychelles, featuring crystal-clear water, soft white sand, and magnificent granite boulders shaped by nature over millions of years.



■ Sainte Anne Marine National Park

Located near Mahé, Sainte Anne Marine National Park is a common choice for boat-based visits, snorkeling, and views of small islands close to the main island.

The park consists of several small islands surrounded by coral reefs and vibrant marine ecosystems.



● Local Culture and Island Life

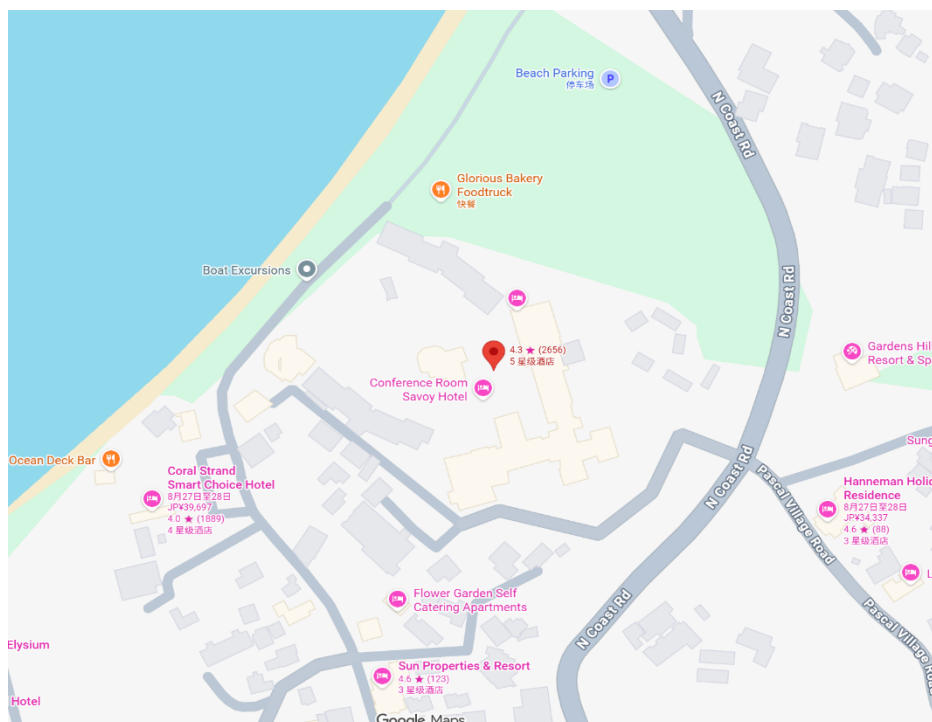
Seychelles culture reflects Creole heritage with influences from Africa, Europe, and Asia.

Participants may experience a relaxed island rhythm through local food, music, crafts, multilingual communication, and community markets. Local cuisine often features fish, coconut, spices, and tropical fruits.

Seychelles is also known for conservation-oriented tourism. Visitors are encouraged to respect wildlife, reduce waste, and follow local rules when visiting marine and nature reserves.

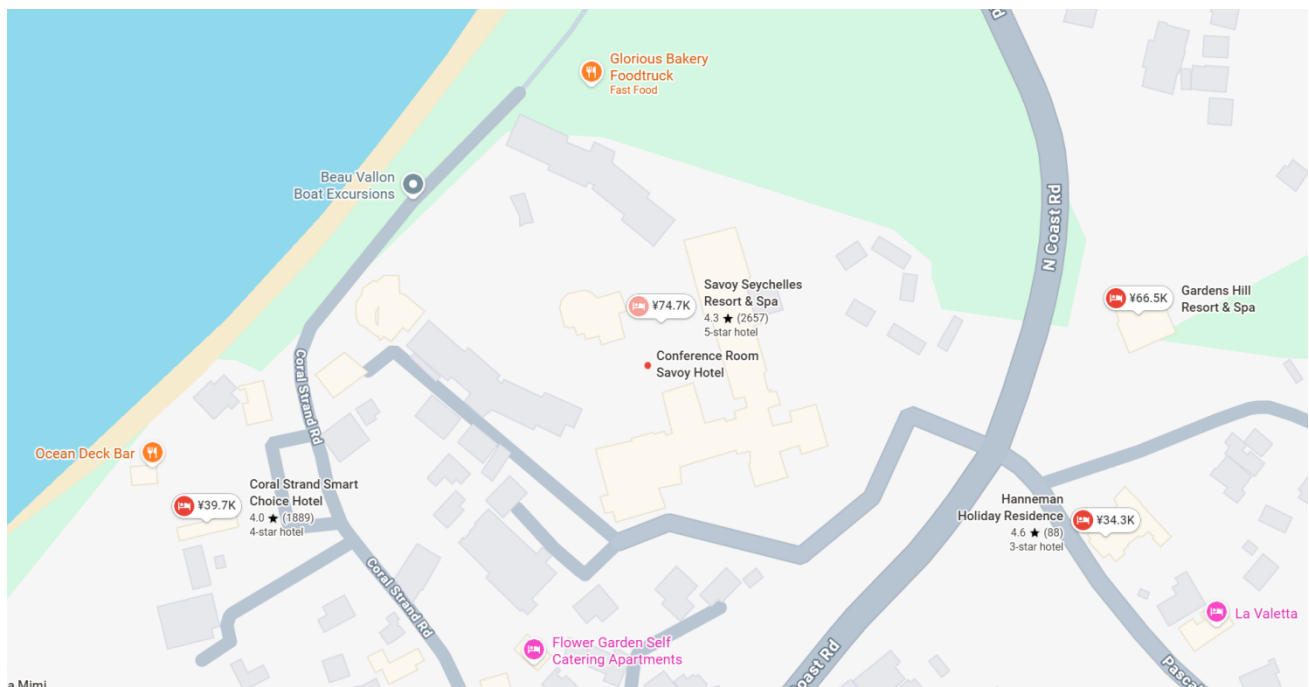
Venue

- **The venue:** Savoy Seychelles Resort & Spa
- **Conference Room:** AMIRANTES BALLROOM
- **Address:** Beau Vallon, Mahé, Seychelles
- **Website:** <https://savoy.sc/about/>



Hotels around the Venue

- **Savoy Seychelles Resort & Spa**
5-star hotel
0-min walk from the Venue
- **Coral Strand Smart Choice Hotel**
4-star hotel
Approx. 5-min walk from the Venue
- **Other Hotels in the region**
Please check the below link for more information about accommodation in Seychelles.
Official Seychelles Tourism Accommodation Guide:
<https://www.seychelles.com/accommodation>



Transportation

- **From Seychelles International Airport (SEZ):**

By Taxi:

Approximately 45 minutes by taxi from Seychelles International Airport (SEZ) to Savoy Seychelles Resort & Spa, depending on traffic conditions and local road conditions.

Route:

Seychelles International Airport (SEZ) → Savoy Seychelles Resort & Spa, Beau Vallon, Mahé

Distance:

Approximately 15 km.

Travel Time:

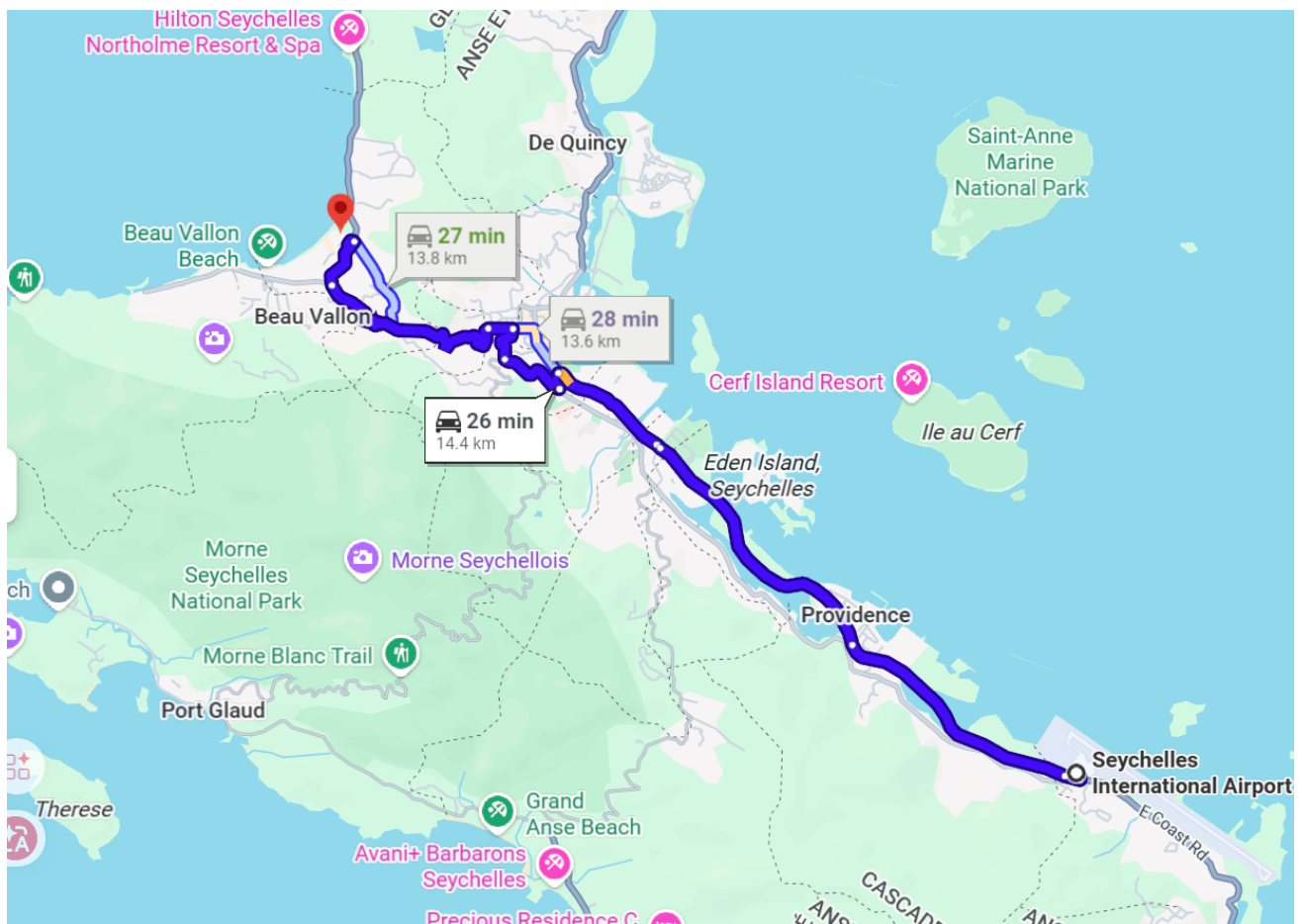
Approximately 45 minutes by taxi.

Transportation reference:

[Seychelles International Airport - Transportation :](#)

<https://seychellesairports.sc/passenger-information/transportation/>

The map below shows the route from **Seychelles International Airport (SEZ)** to **Savoy Seychelles Resort & Spa**.



Conference Rooms

- **AMIRANTES BALLROOM**

The ballroom is a spacious, column-free conference facility with natural daylight and flexible configurations, providing a comfortable environment for international academic exchanges. The ballroom covers approximately 355 m² and can accommodate different seating arrangements for conferences, including theater-style seating for up to 300 participants. The room can also be divided into three sections using soundproof partitions for flexible event arrangements.



- **Venue Photos**



Meeting and conference venue



Conference space and event setting



Conference and event facilities



Hotel environment and resort setting

IEEE RCAR 2026 Program at a Glance

August 18-19, 2026

Tuesday August 18, 2026	
09:00-09:40	Plenary Talk: Jianru Xue Approaches to Safe and Trustworthy Physical Agents
09:40-10:10	Keynote Talk I: Lin Wang Intelligent Human-Machine Interaction in Rehabilitation Robots
10:10-10:30	Coffee Break
10:30-11:00	Keynote Talk II: Yufeng Yue Spatial Perception and Action Learning for Cognitive Navigation
11:00-11:48	Session 1 - TuBP1: Best Conference Paper (Room 1 / Virtual Room A; Tencent ID: 303-451-832)
12:00-13:30	Lunch Break
13:30-14:18	Session 2 - TuBP2: Best Student Paper (Room 1 / Virtual Room A; Tencent ID: 303-451-832)
14:18-15:06	Session 3 - TuBP3: Best Paper in Control (Room 1 / Virtual Room A; Tencent ID: 303-451-832)
15:06-15:26	Coffee Break
15:26-16:14	Session 4 - TuBP4: Best Paper in Robotics (Room 1 / Virtual Room A; Tencent ID: 303-451-832)
16:14-17:02	Session 5 - TuBP5: Best Paper in Bio-Medical Engineering (Room 1 / Virtual Room A; Tencent ID: 303-451-832)
18.30-21.00	Banquet

Wednesday August 19, 2026

09:00-09:30	Keynote Talk III: Le Xie Research on Minimally Invasive Surgical Robots for natural orifices		
09:30-09:50	Session 6 - TuA1: SLAM / Localization / Depth Estimation (Room 1 / Virtual Room B; Tencent ID: 204-470-661)		
09:50-10:20	Session 7 - TuA2: Motion Planning / Navigation (Room 1 / Virtual Room B; Tencent ID: 204-470-661)		
10:20-10:40	Coffee Break		
10:40-11:10	Session 8 - TuA3: Sensing / Perception / Object Detection (Room 1 / Virtual Room B; Tencent ID: 204-470-661)		
11:10-11:35	Session 9 - TuA4: Humanoid & Soft Robots (Room 1 / Virtual Room B; Tencent ID: 204-470-661)		
12:00-13:30	Lunch Break		
Location	Virtual Room 1 Tencent ID: 960-293-267	Virtual Room 2 Tencent ID: 515-645-217	Virtual Room 3 Tencent ID: 122-778-893
14:00-14:40	WeA1: SLAM / Localization / Odometry	WeB1: Dexterous Manipulation / Grasping	WeC1: Surgical / Interventional / Medical Robots
14:40-15:20	WeA2: 3D Reconstruction / Depth Estimation	WeB2: Embodied Intelligence / Manipulation	WeC2: Medical Imaging / Biosignal Processing
15:20-15:40	Coffee Break		
15:40-16:20	WeA3: Object Detection / Segmentation / Pose	WeB3: Motion Planning / Navigation	WeC3: Multi-Robot / Collaboration / Scheduling
16:20-17:00	WeA4: Sensing / Tactile / Vision Hardware	WeB4: UAV / Aerial Robots	WeC4: Robot Control / Modeling
17:00-17:40	WeA5: Deep Learning / Vision AI Methods	WeB5: Humanoid / Legged / Mobile Robots	WeC5: Intelligent Transportation / Applications
17:40-18:00	WeD1: Aerial Perception & Motor Control		

Session Information with Paper IDs

Onsite / Hybrid:

Tuesday August 18, 2026 - Hybrid - 12 minutes per paper				
Time	Section Code	Paper ID	Paper Title	Location
Session 1 - TuBP1: Best Conference Paper (11:00-11:48)				
11:00-11:12	TuBP1	50	ManiCM: Real-time 3D Diffusion Policy via Consistency Model for Robotic Manipulation	Room 1 / VR A: 303-451-832
11:12-11:24	TuBP1	138	SPARC: Sparse Proximity Planning via Gabriel Graphs for Scalable Multi-Robot Target Coverage	Room 1 / VR A: 303-451-832
11:24-11:36	TuBP1	148	Hierarchical Semantic Protocol Graph for Autonomous Thyroid Ultrasound Scanning	Room 1 / VR A: 303-451-832
11:36-11:48	TuBP1	282	Diffusion-Based Trajectory Planning Policy for Robotic Bronchoscopy	Room 1 / VR A: 303-451-832
Session 2 - TuBP2: Best Student Paper (13:30-14:18)				
13:30-13:42	TuBP2	75	Safe Real-Vehicle Autonomous Driving via Offline-to-Online Human-in-the-Loop Reinforcement Learning	Room 1 / VR A: 303-451-832
13:42-13:54	TuBP2	153	A Lightweight Real-Time Framework for Multi-Object Detection, Tracking, and Prediction via Camera-LiDAR Fusion	Room 1 / VR A: 303-451-832
13:54-14:06	TuBP2	225	Energy-Aware Wind-Resilient Routing for Truck-Assisted Multi-UAV Delivery under Wind Uncertainty	Room 1 / VR A: 303-451-832
14:06-14:18	TuBP2	120	S2D-Flow: One-Step Underwater Dense Flow Field Reconstruction	Room 1 / VR A: 303-451-832
Session 3 - TuBP3: Best Paper in Control (14:18-15:06)				
14:18-14:30	TuBP3	79	HUGS: Humanoid Unified General Skill Learning for Challenging Whole-body Motions via Trajectory Tracking from Monocular Videos	Room 1 / VR A: 303-451-832
14:30-14:42	TuBP3	161	A Two-Stage Learning Framework for Autonomous Obstacle Avoidance of an Eel-Like Robot	Room 1 / VR A: 303-451-832
14:42-14:54	TuBP3	131	Collaborative Planning for Multiple Unmanned Vehicles with Isolated Spatio-temporal Bands in Dynamic Community Scenarios	Room 1 / VR A: 303-451-832

Tuesday August 18, 2026 - Hybrid - 12 minutes per paper

Time	Section Code	Paper ID	Paper Title	Location
14:54-15:06	TuBP3	23	Physics-Informed Koopman Linearized MPC with Structured ADMM for Agile Spinal Quadrupedal Locomotion	Room 1 / VR A: 303-451-832
Session 4 - TuBP4: Best Paper in Robotics (15:26-16:14)				
15:26-15:38	TuBP4	85	Design of a High-Expansion-Ratio Hybrid Rigid-Soft Gripper for Multi-Scale Grasping	Room 1 / VR A: 303-451-832
15:38-15:50	TuBP4	121	Design and Control of a Hydraulic Wheel-legged Humanoid Robot: WLR-ZJ	Room 1 / VR A: 303-451-832
15:50-16:02	TuBP4	37	Vision-to-Dexterity: A Monocular Transfer Framework for Robot Hands	Room 1 / VR A: 303-451-832
16:02-16:14	TuBP4	68	End-to-End Obstacle Avoidance for Mobile Robots via Hybrid Spatio-Temporal Networks and Event-Based Vision	Room 1 / VR A: 303-451-832
Session 5 - TuBP5: Best Paper in Bio-Medical Engineering (16:14-17:02)				
16:14-16:26	TuBP5	159	ScolioMorph: A Dual-Stream Transformer-Wavelet Network for Spinal CT–MR Registration	Room 1 / VR A: 303-451-832
16:26-16:38	TuBP5	199	Visual Servo Control of an Endoscope-Holding Surgical Robot under Remote Center of Motion Constraints	Room 1 / VR A: 303-451-832
16:38-16:50	TuBP5	31	FusionAug: gTCN-Based Latent Feature Augmentation for Cross-Subject Hydrocephalus EEG Classification	Room 1 / VR A: 303-451-832
16:50-17:02	TuBP5	74	Continuous Lip-Sync Control for Digital Humans via Neural Motion Retargeting and Dual-modal Alignment	Room 1 / VR A: 303-451-832

Wednesday August 19, 2026 - Hybrid - 5 minutes per paper				
Time	Section Code	Paper ID	Paper Title	Location
Session 6 - TuA1: SLAM / Localization / Depth Estimation (09:30-09:50)				
09:30-09:35	TuA1	77	Sensitivity Analysis of Magnetic Moment Deviation in Magnetic Localization with Sensor Array	Room 1 / VR B: 204-470-661
09:35-09:40	TuA1	86	2DGS-Loc: Geometry-Consistent Visual Localization with Planar Gaussian Splatting	Room 1 / VR B: 204-470-661
09:40-09:45	TuA1	88	CMDepth: Self-Supervised Monocular Depth Estimation based on Hybrid CNN-State Space Models	Room 1 / VR B: 204-470-661
09:45-09:50	TuA1	146	RSL-SLAM: Robust Visual SLAM for Sparse Lunar Environments	Room 1 / VR B: 204-470-661
Session 7 - TuA2: Motion Planning / Navigation (09:50-10:20)				
09:50-09:55	TuA2	61	Autonomous Robotic Task Planning Based on Ontology-Enabled Behavior Tree	Room 1 / VR B: 204-470-661
09:55-10:00	TuA2	76	Inverted-Modeling-Based Motion Planning for Asymmetric Fault-Tolerant Legged Mobile Landers	Room 1 / VR B: 204-470-661
10:00-10:05	TuA2	134	Scaling High-Quality Supervision for Vision-Language Navigation via LMM-Based Data Synthesis	Room 1 / VR B: 204-470-661
10:05-10:10	TuA2	283	TAPA-BG: A Jacobian-Free Averaged-Correction Framework for Distributed Bilevel Games	Room 1 / VR B: 204-470-661
10:10-10:15	TuA2	273	Gateway-Aware Multi-Layer 2.5D Elevation Mapping and Path Planning for Multi-Floor Mobile Robot Navigation	Room 1 / VR B: 204-470-661
10:15-10:20	TuA2	285	A Convergence-Guaranteed Learning-to-Optimize Method for Distributed LASSO	Room 1 / VR B: 204-470-661
Session 8 - TuA3: Sensing / Perception / Object Detection (10:40-11:10)				
10:40-10:45	TuA3	87	Software-Based Timing Characterization of a BLE-to-CAN Physiological Sensing Architecture for Robotic Systems	Room 1 / VR B: 204-470-661
10:45-10:50	TuA3	89	A Perspective Review of Learning Algorithms in Radar-Based Fall Detection for Elderly Home Care	Room 1 / VR B: 204-470-661
10:50-10:55	TuA3	90	Reading QR Codes on Curved and Folded Surfaces via HueCode-Based Fiducial Marker Overlay and Planar Restoration	Room 1 / VR B: 204-470-661

Wednesday August 19, 2026 - Hybrid - 5 minutes per paper				
Time	Section Code	Paper ID	Paper Title	Location
10:55-11:00	TuA3	116	Short-History Pedestrian Trajectory Prediction with Hierarchical Intent Guidance	Room 1 / VR B: 204-470-661
11:00-11:05	TuA3	169	YOLOv11-MMD: Real-Time Underwater Visual Perception for Floc Monitoring in Sedimentation Tanks	Room 1 / VR B: 204-470-661
11:05-11:10	TuA3	214	A Lightweight Space Debris Detection Framework Based on Improved RT-DETR	Room 1 / VR B: 204-470-661
Session 9 - TuA4: Humanoid & Soft Robots (11:10-11:35)				
11:10-11:15	TuA4	65	Toward Actuatable Reconstruction of Soft Manipulators with Deformable Gaussians	Room 1 / VR B: 204-470-661
11:15-11:20	TuA4	117	A Hierarchical Architecture for Humanoid Hand Reaching with Guided Diffusion Planning	Room 1 / VR B: 204-470-661
11:20-11:25	TuA4	118	From Generated Motion to Physical Execution: A Hierarchical Framework for Humanoid Motion Tracking	Room 1 / VR B: 204-470-661
11:25-11:30	TuA4	125	Reference-Augmented Learning for Precise Tracking Policy of Tendon-Driven Continuum Robots	Room 1 / VR B: 204-470-661
11:30-11:35	TuA4	257	PhysiFlow: Physics-Aware Humanoid Whole-Body VLA via Multi-Brain Latent Flow Matching and Robust Tracking	Room 1 / VR B: 204-470-661

Online:

Wednesday August 19, 2026 - 5 minutes per paper									
Section Code	Section Theme	Paper ID						Virtual Meeting Room	Time
WeA1	SLAM / Localization / Odometry	24	133	152	261	264	266	Virtual Room 1 (Tencent ID: 960-293-267)	14:00-14:40
WeB1	Dexterous Manipulation / Grasping	78	158	235	240	252	259	Virtual Room 2 (Tencent ID: 515-645-217)	14:00-14:40
WeC1	Surgical / Interventional / Medical Robots	29	38	140	194	234	250	Virtual Room 3 (Tencent ID: 122-778-893)	14:00-14:40
WeA2	3D Reconstruction / Depth Estimation	95	151	173	174	175	262	Virtual Room 1 (Tencent ID: 960-293-267)	14:40-15:20
WeB2	Embodied Intelligence / Manipulation	83	135	136	162	209	243	Virtual Room 2 (Tencent ID: 515-645-217)	14:40-15:20
WeC2	Medical Imaging / Biosignal Processing	63	98	110	122	123	192	Virtual Room 3 (Tencent ID: 122-778-893)	14:40-15:20
WeA3	Object Detection / Segmentation / Pose	70	71	84	149	260	263	Virtual Room 1 (Tencent ID: 960-293-267)	15:40-16:20
WeB3	Motion Planning / Navigation	40	64	73	155	163	222	Virtual Room 2 (Tencent ID: 515-645-217)	15:40-16:20

Wednesday August 19, 2026 - 5 minutes per paper

Section Code	Section Theme	Paper ID						Virtual Meeting Room	Time
WeC3	Multi-Robot / Collaboration / Scheduling	47	132	144	156	280	281	Virtual Room 3 (Tencent ID: 122-778-893)	15:40-16:20
WeA4	Sensing / Tactile / Vision Hardware	62	66	67	109	126	157	Virtual Room 1 (Tencent ID: 960-293-267)	16:20-17:00
WeB4	UAV / Aerial Robots	53	55	57	115	241	258	Virtual Room 2 (Tencent ID: 515-645-217)	16:20-17:00
WeC4	Robot Control / Modeling	119	143	154	191	200	206	Virtual Room 3 (Tencent ID: 122-778-893)	16:20-17:00
WeA5	Deep Learning / Vision AI Methods	108	124	164	211	244	245	Virtual Room 1 (Tencent ID: 960-293-267)	17:00-17:40
WeB5	Humanoid / Legged / Mobile Robots	54	181	203	215	218	226	Virtual Room 2 (Tencent ID: 515-645-217)	17:00-17:40
WeC5	Intelligent Transportation / Applications	60	107	145	170	248	269	Virtual Room 3 (Tencent ID: 122-778-893)	17:00-17:40
WeD1	Aerial Perception & Motor Control	97	99					Virtual Room 1 (Tencent ID: 960-293-267)	17:40-18:00

9:00 – 9:40, Tuesday, Aug. 18, 2026

Plenary Talk

Approaches to Safe and Trustworthy Physical Agents

Jianru Xue

Professor, Xi'an Jiaotong University



Biography: Jianru Xue, PhD, Professor. He received his PhD degrees from Xi'an Jiaotong University in 2003. He has joined Xi'an Jiaotong University since 1999. He had worked in FujiXerox, Tokyo, Japan, from 2002 to 2003. In 2008-2009, he had visited University of California, Los Angeles. His research interests include pattern recognition and machine learning, autonomous systems and hybrid augmented intelligence. He and his team won National Natural Science Award (second class) in 2016, National Technology Invention Award in 2007, the IEEE ITSS Institute Lead Award in 2014. He has published 100+ papers in top cited journals and conferences including IEEE TPAMI/TIP/TSMCB, CVPR, ICCV, ECCV, ACM MM, RSS, ICRA, IROS etc.

Abstract: Physical agents face an urgent need to collaborate efficiently with humans in open, dynamic environments. To address the uncertainties inherent in these settings, researchers propose designing policies by integrating Deep Reinforcement Learning (DRL) with Large Language Models (LLMs). The continuous emergence of physical agents with diverse morphologies is generating global, diverse, and large-scale closed-loop data, significantly propelling the development of data-driven autonomous policy learning. However, concerns regarding the safety and trustworthiness of autonomous behaviors are just beginning to surface—the tip of the iceberg. This report focuses on approaches for designing safe and trustworthy autonomous physical agents under uncertainty from two perspectives: endogenous safety and safety filters. We propose combining traditional controller design frameworks grounded in mathematical models with the emerging paradigm of LLM-integrated DRL. The report highlights our team's recent progress in these areas and outlines several fundamental research questions worthy of further consideration.

9:40–10:10, Tuesday, Aug. 18, 2026

Keynote Talk I

Intelligent Human-Machine Interaction in Rehabilitation Robots

Lin Wang

Professor, Chinese Academy of Sciences



Biography: Professor Lin Wang is Director of the Shenzhen lower limb intelligent rehabilitation device engineering research center at Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences. Her research interests lie on Embodied motion rehabilitation robot and intelligent human machine interaction technology in neuromusculoskeletal dysfunction.

Abstract: The natural and efficient assistance of walking assistive robots is an urgent need for human movement and rehabilitation. Currently, the actuation strategies of rehabilitation robots are lack functional bionics. This work describes the key technologies of the precise human motion sensing and feedback, efficient transmitting mechanical drives from human to robot, and intelligent control of the natural force driven rehabilitation system with human in the loop.

10:30–11:00, Tuesday, Aug. 18, 2026

Keynote Talk II

Spatial Perception and Action Learning for Cognitive Navigation

Yufeng Yue

Professor, Beijing Institute of Technology &
Vice Dean, School of Automation



Biography: Dr. Yufeng Yue is the Full Professor and Vice Dean at the School of Automation, Beijing Institute of Technology. He received the B.Eng. degree in automation from the Beijing Institute of Technology, Beijing, China, in 2014, and Ph.D. degree from Nanyang Technological University, Singapore in 2019. He served as a Research Fellow with Nanyang Technological University, Singapore, from 2018 to 2020. He was a visiting scholar with University of California, Los Angeles in 2019. He has authored a book in Springer, and published more than 60 journal/conference papers, including IJRR, IEEE TRO/TNNLS/TMech/TII/TIE/TITS/RAL, and NeurIPS/CVPR/ICCV/ICRA/IROS. He is the recipient of IROS 2025 New Generation Star Project. He has received the 2020 IEEE ICARCV Best Paper Award and 2021/2023/2024 IEEE ICUS Best Paper Award. He serves as AE for IEEE TRO/RAL/ICRA/IROS.

Abstract: Cognitive navigation is an emerging navigation paradigm that learns and evolves through continuous interaction with the environment, deeply integrating advances in navigation technology, cognitive science, artificial intelligence, and real-world applications. This presentation explores how robots can perceive and understand space using multimodal information in a human-like manner and, on this basis, continuously learn behavioral strategies through environmental interaction to achieve higher-level cognitive navigation. It will introduce the concept and scope of cognitive navigation, analyze the significance of spatial perception and behavior learning for its realization, review recent research progress in these areas, and discuss future trends in addressing the new challenges posed by open environments.

9:00 – 9:30, Wednesday, Aug. 19, 2026

Keynote Talk III

Research on Minimally Invasive Surgical Robots for natural orifices

Le Xie

Professor, Shanghai Jiao Tong University &
Vice Dean, Medical Robotics Research Institute



Biography: Professor Le Xie is Vice Dean of the Medical Robotics Research Institute at Shanghai Jiao Tong University, and Deputy Director of the Rehabilitation Engineering Research Institute at Shanghai Jiao Tong University. Vice Chairman of the Digital Medicine Branch of the Chinese Medical Association.

Abstract: Surgical robots have broken through the limitations of human eyes and arms, and robotic surgery has gradually become the development direction of minimally invasive surgery. Describe the key technologies of the mechanism design, force sensing and feedback, and intelligent control of the minimally invasive natural orifices surgery system.