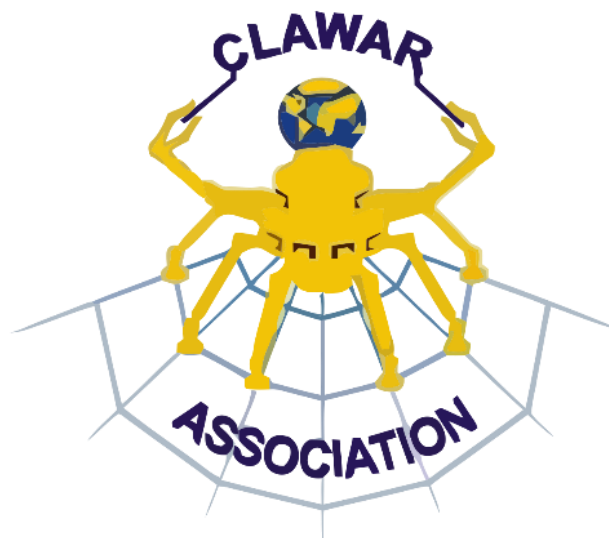




Technical Program



Welcome to CLAWAR 2026

It is our pleasure to welcome you all to the CLAWAR 2026 conference, held in Cranfield University, UK, during 14 – 16 September 2026. CLAWAR 2026 is the 29th edition of the International Conference series on Climbing and Walking Robots and the Support Technologies for Mobile Machines and brings new developments and new research findings in robotics technologies within the framework of “Exploration, Resilience and Recovery”. The conference's technical programme includes three keynote presentations, given by well-known scientists in their fields of research, and 29 original articles with cutting-edge scientific findings in a wide range of topics related to the rapidly evolving areas of robotics. We hope that CLAWAR 2026 will enable delegates to exchange research ideas and establish collaborative networks for the advancement of science and knowledge discovery in the field of robotics and associated technologies, for a sustainable future.

The CLAWAR 2026 proceedings are published by Springer in their book series in “Lecture Notes in Networks and Systems”, which is indexed in Web of Science, dblp, and SCOPUS. This book is believed to be a source of inspiration and further innovation in research and development in the rapidly growing area of mobile service robotics.

We would like to thank members of the International Scientific Committee and National Organising Committee of CLAWAR 2026 for their efforts in reviewing the submitted articles, and for their support in the planning and organisation of the conference.

Sarah Fletcher, M. Osman Tokhi, Manuel F. Silva, and Anne-Marie Oostveen
General Co-Chairs, CLAWAR 2026

CLAWAR 2026 Conference Organization

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M. Osman Tokhi, London South Bank University, UK
Manuel F. Silva, ISEP, Polytechnic of Porto & INESC TEC, Portugal
Anne-Marie Oostveen, Cranfield University, UK

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Anne-Marie Oostveen, Cranfield University, UK

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Jingyi Zhang, Cranfield University, UK
Gilbert Tang, Cranfield University, UK
Mikel Bueno Viso, Cranfield University, UK
Christopher Burns, Cranfield University, UK
Anne-Marie Oostveen, Cranfield University, UK

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Manuel F. Silva, ISEP & INESC TEC, Portugal
Anne-Marie Oostveen, Cranfield University, UK

Special/Workshop Sessions Co-Chairs

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Tiago Trindade Ribeiro, Brazil
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Vivian Suzano Medeiros, Brazil
Ye Gu, PRC
Zaharuddin Mohamed, Malaysia
Zhanat Kappasov, Kazakhstan
Zhanfang Zhao, UK
Zhangguo Yu, PRC

CLAWAR 2026 Technical Programme

Monday 14 September 2026

Time: 12:00 – 13:00 (GMT+1)	
12:00-13:00	Conference Registration

13:00-14:00	Lunch
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Time: 14:00 – 14:20 (GMT+1)	
14:00-14:20	Opening Session

Keynote Address – 1			
Session Chair: Osman Tokhi			
Room: Vincent auditorium			
Time: 14:20 – 15:20 (GMT+1)			
Time	Paper ID	Proc Page	Presentation
14:20-15:20	KS1		AMPHIBIOUS CRAB-LIKE WALKING ROBOTS <i>Kathryn Daltorio</i>

15:20-15:40	Coffee break
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Session M1: Advanced Mechanisms & Multi-Robot Systems			
Session Chair: Iveta Eimontaite			
Room: Vincent auditorium			
Time: 15.40– 17:20 (GMT+1)			
Time	Paper ID	Proc Page	Presentation
15.40-16:00	#02		BALANCING EXPANSION AND CONTRACTION: COORDINATING MULTI-AGENT TEAMS UNDER COMPETING GOALS <i>Federico Oliva, Daniel Zelazo and Amir Degani</i>

16:00-16:20	#18		RIDER BEHAVIOR IDENTIFICATION USING MACHINE LEARNING FOR OPTIMIZED ENERGY EFFICIENCY IN ELECTRIC MOBILE PLATFORMS <i>Nurul Muthmainnah Mohd Noor, Siti Fauziah Toha, Ahmad Syahrin Idris and Mohamad Osman Tokhi</i>
16:20-16:40	#30		ACTUATOR-INDEPENDENT PARAMETER ESTIMATION FOR MORPHOLOGY-ADAPTIVE ROBOT CONTROL <i>Simon Untergasser and Manfred Hild</i>
16:40-17:00	#31		TOWARDS QUADRUPEL-PROVIDED LOCALIZATION AND ACTIVE TRACKING FOR MICRO-UAVS <i>Alejandro Lorite Mora and Andrés Faiña</i>
17:00-17:20	#32		GAIT-DEPENDENT EFFECTS ON QUADRUPEL LOCOMOTION FOR LOAD-CARRYING USING PASSIVE MECHANISMS <i>Giovanni Dessy</i>

Tuesday 15 September 2026

Time: 08:00 – 09:00 (GMT+1)	
08:00-09:00	Conference Registration

Keynote Address – 2 Session Chair: Manuel Silva Room: Vincent auditorium			
Time: 09:00 – 10:00 (GMT+1)			
Time	Paper ID	Proc Page	Presentation
09:00-10:00	KS2		COLLABORATIVE ROBOTS IN INDUSTRY – WHERE ARE THEY LEADING US? <i>Phil Webb</i>

10:00-10:20	Coffee break
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Session T1: Assistive & Rehabilitation Robotics Session Chair: Gilbert Tang Room: Vincent auditorium			
Time: 10:20 – 11:40 (GMT+1)			
Time	Paper ID	Proc Page	Presentation
10:20-10:40	#09		DEVELOPMENT OF A SUPPORT DEVICE FOR LP GAS CYLINDER TRANSPORTATION USING A BASE WITH PROTRUSIONS FOR STABLE HOLDING AND EASY LOWERING <i>Sena Furuki, Seiya Ito, Rie Nishihama, Fumio Ito, Manabu Okui and Taro Nakamura</i>
10:40-11:00	#16		REAL-TIME STANDING ASSISTANCE BASED ON PATIENT-SPECIFIC FUNCTIONAL STABILITY MARGIN REPRESENTATION <i>Ryuki Yoshida, Haruki Asai, Daisuke Chugo, Ken-Ichi Tabei, Satoshi Muramatsu, Sho Yokota, Jinhua She and Hiroshi Hashimoto</i>
11:00-11:20	#19		DEVELOPMENT OF A LIGHTWEIGHT KNEE EXOSKELETON FOR HUMAN MOTION ASSISTANCE <i>Carla Finocchiario, Giuseppe Sutura, Dario Calogero Guastella and Giovanni Muscato</i>

11:20-11:40	#36		PEDALING LOAD DESIGN FOR INDUCING TARGET MUSCLE ACTIVITY IN GAIT-RELATED TRAINING TASKS <i>Ryutaro Shigyo, Honoka Kubo, Daisuke Chugo, Ken-Ichi Tabei, Satoshi Muramatsu, Sho Yokota, Jinhua She and Hiroshi Hashimoto</i>
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Session T2: Sensing & Perception for Autonomous Systems Session Chair: Christopher Burns Room: Vincent auditorium			
Time: 11:40 – 13:00 (GMT+1)			
Time	Paper ID	Proc Page	Presentation
11:40-12:00	#01		POSE AND SHAPE ESTIMATION OF A SOFT, MULTI-STABLE ROBOT FOR SEARCH AND RESCUE USING INTERNAL VISION-BASED SENSING <i>Rotem Kain, Lior Salem, Federico Olivia and Amir Degani</i>
12:00-12:20	#22		AGILE AGRICULTURAL ROBOT GUIDANCE THROUGH MULTI-MODAL CONTROL AND SENSOR FUSION <i>Mateusz Nijak, Piotr Skrzypczyński and Krzysztof Zdanowicz</i>
12:20-12:40	#27		MULTI-CUE GEOMETRIC RELIABILITY ESTIMATION FOR ROBOT POINT CLOUD MAPPING IN GEOMETRICALLY DEGRADED ENVIRONMENTS <i>Yiqin Wang, Cheng Hu, Hongye Su and Xie Lei</i>
12:40-13:00	#28		GEOMETRY-PRESERVING NEURAL ACCELERATION FOR EVENT-FLOW VELOCITY ESTIMATION <i>Cheng Hu, Yiqin Wang, Xie Lei and Hongye Su</i>

13:00-14:00	Lunch
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15:00-18:00	Social Program - Visit to the National Museum of Computing at Bletchley Park
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19:00-22:00	Conference Banquet – Mitchell Hall, Cranfield (Square 2E in the map provided) Announcement of CLAWAR 2027
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Wednesday 16 September 2026

Time: 08:00 – 09:00 (GMT+1)	
08:00-09:00	Conference Registration

Keynote Address – 3 Session Chair: Sarah Fletcher Room: Vincent auditorium			
Time: 09:00 – 10:00 (GMT+1)			
Time	Paper ID	Proc Page	Presentation
09:00-10:00	KS3		BETTER AUTONOMY THROUGH UNCERTAINTY <i>Nick Hawes</i>

10:00-10:20	Coffee break
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Session W1: Learning & Control Strategies for Locomotion Session Chair: Manuel Silva Room: Vincent auditorium			
Time: 10:20 – 11:40 (GMT+1)			
Time	Paper ID	Proc Page	Presentation
10:20-10:40	#10		TASK-CONDITIONED UNCERTAINTY COSTMAPS FOR LEGGED LOCOMOTION <i>Kartikeya Singh, Christo Aluckal, Romeo Orsolino and Karthik Dantu</i>
10:40-11:00	#20		LEARNING ROLLER-SKATING MOTIONS OF HUMANOID ROBOTS BASED ON ADVERSARIAL MOTION PRIORS <i>Yunkang Cheng, Yutong Wu, Menghan Li, Shihe Zhou and Mingguo Zhao</i>
11:00-11:20	#23		AUTONOMOUS LOCOMOTION FROM SELF-EXPLORED EQUILIBRIUM GRAPHS ON A PLANAR BIPED <i>Vincent Rist, Manfred Hild and Udo Frese</i>

11:20-11:40	#29		DIRECTED SELF-EXPLORATION VIA PHASE-SPACE COVERAGE, MEASURED AGAINST A TWO-LAYER GROUND TRUTH <i>Simon Untergasser and Manfred Hild</i>
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Session W2: Bio-inspired Robotics & Advanced Actuation Session Chair: Gilbert Tang Room: Vincent auditorium			
Time: 11:40 – 13:00 (GMT+1)			
Time	Paper ID	Proc Page	Presentation
11:40-12:00	#04		PARAMETRIC ANALYSIS OF PITCH, LENGTH, AND NUMBER OF FLAGELLA IN FEM-BASED SWIMMING SIMULATION OF A WRAPPING FLAGELLA-TYPE ROBOT <i>Fumio Ito, Takeshi Masuzawa, Keiko Ishii and Taro Nakamura</i>
12:00-12:20	#11		DESIGN OF A LEG MECHANISM FOR A WALL-CLIMBING ROBOT INSPIRED BY LADYBIRD LEGS <i>Sota Yasutome, Yuki Ueno and Naoe Hosoda</i>
12:20-12:40	#12		DEVELOPMENT OF A MAGNETICALLY TUNABLE MATERIAL WITH TILTED ORIENTATION EXHIBITING MECHANICAL POLARITY FOR VIBRATION ACTUATION <i>Keita Fukuyama, Junjie Liu, Fumio Ito, Makoto Iwai, Masakazu Hattori and Taro Nakamura</i>
12:40-13:00	#13		HARVESTING SOLAR ENERGY BY ADJUSTING POSTURE IN MOBILE QUADRUPED ROBOTS <i>William Bellemans, Laurens Vandormael and Alexander Badri-Sproewitz</i>

13:00-14:00	Lunch
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Session W3: Industrial Applications, Maintenance & Construction Session Chair: Iveta Eimontaite Room: Vincent auditorium			
Time: 14:00 – 15:20 (GMT+1)			
Time	Paper ID	Proc Page	Presentation

14:00-14:20	#03		WALKING ON ROOFS: EXPLORING THE POTENTIAL OF WALKING ROBOTS FOR CONSTRUCTION WORK ON ROOFS <i>Björn-Felix Dettmar and Arne Roennau</i>
14:20-14:40	#07		DYNAMIC CLEANING PERFORMANCE EVALUATION OF A SELF-PROPELLED SQUARE-DUCT CLEANING ROBOT INTEGRATING A PLANETARY GEAR AND CENTERING MECHANISM <i>Takumi Okamoto, Yuki Ono, Yosuke Momma, Fumio Ito and Taro Nakamura</i>
14:40-15:00	#08		DEVELOPMENT OF A GRIPPING MECHANISM WITH SHARP SPIKES FOR A PERISTALTIC SEA ICE DRILLING ROBOT <i>Yugo Aoki, Satoshi Ogaki, Yosuke Suzuki, Ryunosuke Sawahashi, Fumio Ito, Hiroshi Yoshida and Taro Nakamura</i>
15:00-15:20	#34		CALF-INTEGRATED ARMS FOR BIMANUAL QUADRUPED LOCO-MANIPULATION <i>Yan Pan, Yuanchuan Ren, Chipui Chan, Jingcheng Sun and Chengxu Zhou</i>

15:20-15:40	Coffee break		
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Session W4: Ethics, Safety & Human-Robot Interaction (HRI) Session Chair: Iveta Eimontaite Room: Vincent auditorium			
Time: 15:40 – 17:00 (GMT+1)			
Time	Paper ID	Proc Page	Presentation
15:40-16:00	#06		CLIMBING AND WALKING ROBOTS: RETHINKING THE ASSUMPTIONS OF EXISTING SAFETY STANDARDS <i>Anne-Marie Oostveen</i>
16:00-16:20	#15		PERCEPTIONS OF HUMANOID ROBOTS IN CONSTRUCTION: AN EXPLORATORY STUDY OF INDUSTRY EXPECTATIONS AND BOUNDARIES <i>Anne-Marie Oostveen, Iveta Eimontaite, Vassos Chrysostomou, Sarah Fletcher and Phil Webb</i>
16:20-16:40	#17		A REVIEW OF HUMANOIDS IN CONSTRUCTION AND MANUFACTURING <i>Gautham Ragunathan, Maninee Bambole, Rosalind Edwards, Flavin John, Gianmarco Pisanelli, Stephen Hallam-Bowles and Daniela Sawyer</i>

16:40-17:00	#26		HUMAN DIGNITY AS A DESIGN PRINCIPLE FOR SOCIAL ROBOTS: TOWARD AN ETHICAL FRAMEWORK FOR HUMAN-ROBOT INTERACTION <i>Hyoungbin Park</i>
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17:00-17:30	Closing Session		
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Venue: Cranfield University, MK43 0AL, UK

