

# CLAWAR 2014 Technical programme sessions

Day-1: Monday 21 July 2014

<b>Keynote Address – 1</b>		
<b>Session Chair: Gurvinder S. Virk</b>		
<b>Time: 09.20 - 10.20</b>		
<b>Venue: CW1</b>		
Paper ID	Proc Page	Presentation
2	38	Mobile robots coordination and its application to iCART (Intelligent Cooperative Autonomous Robot Transporters) <i>Kazuhiro Kosuge</i>

## CLAWAR 2014 POZNAN 17<sup>TH</sup> INTERNATIONAL CONFERENCE ON CLIMBING AND WALKING ROBOTS 21-23 JULY 2014

<b>Session – A1: Autonomous robots</b>		
<b>Session Chair: Heinz Wörn</b>		
<b>Time: 10.40 – 12.40</b>		
<b>Venue: CW7</b>		
Paper ID	Proc Page	Presentation
19	95	Energy and time minimization by means of trajectory planning in mobile robots <i>G. Hachem, A. Paczynski, J. Feczko and M. Giergiel</i>
20	101	Investigation into the influence of the foot attachment point in the body on the four-link robot jump characteristics <i>S. F. Jatsun, O. G. Loktionova, L. Y. Volkova and A. S. Yatsun</i>
22	159	Wheel-walking pneumatically actuated robot <i>A. Aliseychik, I. Orlov, E. Stepanova and V. Pavlovsky</i>
25	109	Optimization of motion primitives for high-level motion planning of modular robots <i>V. Vonasek, O. Penc, K. Kosnar and L. Preucil</i>
34	117	Design and experimental verification of an intelligent wall-climbing welding robot system <i>Z. Gui, Y. Deng, Z. Sheng, T. Xiao, Y. li, F. Zhang, N. Dong and J. Wu</i>
36	125	A semi-autonomous manipulator system for decontamination and release measurement <i>M. Mende, S. Notheis, D. Stogl, B. Hein, H. Wörn, P. Kern and S. Gentes</i>

<b>Session – B1: Biologically-inspired systems and solutions</b>		
<b>Session Chair: Teresa Zielińska</b>		
<b>Time: 10.40 – 12.40</b>		
<b>Venue: CW8</b>		
Paper ID	Proc Page	Presentation
38	175	New foot mechanism with one and two longitudinal arches for biped robots <i>K. Shibuya and Y. Urakubo</i>
49	183	Adjustment of pressure in antagonistic joints with pneumatic artificial muscles for rapid reacting motions <i>K. Tanaka, S. Nishikawa and Y. Kuniyoshi</i>
51	191	Development of an omnidirectional mobile robot with a spiral-type traveling-wave-propagation mechanism <i>M. Konno, Y. Mizota and T. Nakamura</i>
65	199	Self-adjustable transducer for bio-inspired strain detection in walking legs <i>M. Schaeffersmann, A. Schneider and J. Schmitz</i>
83	215	Motion generalization with dynamic primitives <i>J. Rosado, F. Silva and V. Santos</i>
89	223	A study of the complete stride cycle in dynamically stable quadrupedal running <i>K. J. Waldron</i>

<b>Session – C1: Locomotion-1</b>		
<b>Session Chair: Karsten Berns</b>		
<b>Time: 10.40 – 12.40</b>		
<b>Venue: CW9</b>		
Paper ID	Proc Page	Presentation
13	315	Concurrent optimization of mechanical design and locomotion control of a legged robot <i>K. M. Digumarti, C. Gehring, S. Coros, J. Hwangbo and R. Siegwart</i>
24	335	CPG-based control of bipedal walking by exploiting plantar sensation <i>D. Owaki and A. Ishiguro</i>
28	343	Effects of the vertical CoM motion on energy consumption for walking humanoids <i>S. Omran, S. Sakka and Y. Aoustin</i>
32	353	Comparing arc-shaped feet and rigid ankles with flat feet and compliant ankles for a dynamic walker <i>I. Kuhlemann, J.-M. Braun, F. Wörgötter and P. Manoonpong</i>
35	361	Adding adaptable toe stiffness affects energetic efficiency and dynamic behaviors of limit cycle walking <i>S. Sun, Y. Huang and Q. Wang</i>
47	369	Online adaptive leg trajectories for multi-legged walking robots <i>A. Roennau, G. Heppner and R. Dillmann</i>

<b>Keynote Address – 2</b>		
<b>Session Chair: Ken Waldron</b>		
<b>Time: 14.00 - 15.00</b>		
<b>Venue: CW1</b>		
Paper ID	Proc Page	Presentation
1	3	Abstractions for legged locomotion <i>Gabriel Lopes</i>

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AND WALKING ROBOTS 21-23 JULY 2014

<b>Session – D1: Autonomous robots &amp; modeling and simulation of CLAWAR</b>		
<b>Session Chair: M. Osman Tokhi</b>		
<b>Time: 15.20 – 17.40</b>		
<b>Venue: CW7</b>		
Paper ID	Proc. Page	Presentation
41	133	Performance of a two wheeled robot with extendable intermediate body on irregular terrains <i>S. A. Agouri, M. O. Tokhi, A. M. Almehal, O. Sayidmarie and K. M. Goher</i>
71	141	Balancing and control of a two-wheeled robot on inclined surface <i>O. Sayidmarie, S. A. Agouri and M. O. Tokhi</i>
79	149	Potential field multi-objective optimization for robot path planning using genetic algorithm <i>H. H. Shehata and J. Schlattmann</i>
6	559	3D real-time simulation framework for wall-climbing robots - Towards the new climbing robot CREA <i>D. Schmidt and K. Berns</i>
17	567	Dynamic simulation of legged robots using a physics engine <i>D. Belter, P. Skrzypczynski, K. Walas, P. Fankhauser, C. Gehring, M. Hutter, M. Hoepflinger and R. Siegwart</i>
88	575	Multi robot simulator for robot operator training in TIRAMISU project <i>J. Będkowski, M. Pełka, P. Musialik and A. Masłowski</i>
94		HLPR CHAIR: Home lift, position and rehabilitation device for the home or patient care facilities <i>R. Bostelman</i>

<b>Session – E1: Manipulation, gripping, manufacturing and underwater robots</b>		
<b>Session Chair: Kenneth J Waldron</b>		
<b>Time: 15.20 – 17.40</b>		
<b>Venue: CW8</b>		
Paper ID	Proc. Page	Presentation
43	461	Versatile - High power gripper for a six legged walking robot <i>G. Heppner, T. Buettner, A. Roennau and R. Dillmann</i>
66	477	Pre-configured XY-axis cartesian robot system for a new ATLAS scanning facility <i>H. Marin-Reyes, R. French, P. Hodgson, K. Parker, J. Wilson and P. Dervan</i>
76	469	Second-order mobility analysis of grasps considering contact surface geometry <i>T. Yamada, H. Torii, H. Yamamoto and R. Johansson</i>
11	487	Safety and performance standard developments for automated guided vehicles <i>R. Bostelman, T. Hong and R. Eastman</i>
53	495	Design of an all-terrain spherical jumping robot with high-dynamic motion <i>V. Bilous, A. Safonov, U. Schmucker and A. Telesh</i>
18	503	A portable underwater robot with tensegrity body composed of thruster units <i>M. Shibata, T. Miyamura and N. Sakagami</i>
29		Six Degree of freedom underwater vehicle for culvert inspection <i>R. Caballero, A. Vega, A. Berbey and M. Armada</i>

<b>Session – F1: Locomotion-2</b>		
<b>Session Chair: Marco Hutter</b>		
<b>Time: 15.20 – 17.40</b>		
<b>Venue: CW9</b>		
Paper ID	Proc. Page	Presentation
48	324	Coupled elastic actuation for biped walking <i>B. Wu, M. Zhao and K. Deng</i>
50	377	Characterizing swing-leg retraction in walking and running <i>K. Poggensee, M. Sharbafi and A. Seyfarth</i>
52	385	Virtual impedance path-following walking control for a six-legged robot <i>H. Uchida and K. Takahashi</i>
59		Locomotion of in-plane robot with continuously sliding feet <i>D. Zarrouk, A. Pullin and R. Fearing</i>
69	409	Transition from walking to running of a bipedal robot to optimize energy efficiency <i>U. Römer, F. Bauer and A. Fidlin</i>
82	417	Graph-search based footstep planning for multi-legged robots on irregular terrain by using depth-sensor <i>S. Kishi and S. Inagaki</i>
70		Design of isostatic exoskeletons for human anatomical joint <i>V. A. D. Cai and P. Bidaud</i>

**Day -2: Tuesday 22 July 2014**

<b>Keynote Address – 3</b>		
<b>Session Chair: Karsten Berns</b>		
<b>Time: 09.00 - 10.00</b>		
<b>Venue: CW1</b>		
Paper ID	Proc Page	Presentation
4	40	CLAWAR to service robots <i>Gurvinder S. Virk</i>

<b>CA Presentation: CA report, CLAWAR 2015</b>		
<b>Session Chair: M. Osman Tokhi</b>		
<b>Time: 10.00 – 10.20</b>		
<b>Venue: CW1</b>		

<b>Session – A2: Assistive exoskeleton robots</b>		
<b>Session Chair: Gurvinder S. Virk</b>		
<b>Time: 10.40 – 12.40</b>		
<b>Venue: CW7</b>		
Paper ID	Proc Page	Presentation
x01		The EXO_LEGS project <i>M. O. Tokhi</i>
55	53	ROBO-MATE: Exoskeleton to enhance industrial production <i>K. S. Stadler, W. J. Elspass and H. W. van de Venn</i>
46	531	Control of sit-to-stand in paraplegics using ANFIS - Simulation study <i>R. Hussain, M. Al-Mawaldi, R. Massoud and M. O. Tokhi</i>
80	77	Finite state control of exoskeleton and wheel walker for gait restoration <i>D. Miranda-Linares and M. O. Tokhi</i>
91	85	EXO-LEGS for elderly persons <i>G. S. Virk, U. Haider, I. N. Indrawibawa, R. K. Thekkeparampudom and N. Masud</i>
61	539	Internal models support specific gaits in orthotic devices <i>J.-M. Braun, F. Wörgötter and P. Manoonpong</i>

<b>Session – B2: Service robots</b>		
<b>Session Chair: Bryan Bridge</b>		
<b>Time: 10.40 – 12.40</b>		
<b>Venue: CW8</b>		
Paper ID	Proc Page	Presentation
67	627	Modeling and simulation of a silo cleaning robot <i>K. Dandan, A. Ananiev and I. Kalaykov</i>
15	636	Mechanism design and experiments of a multi-function cleaning robot <i>Y. Hong, R. Sun, S. Yu, J. Li, W. Li and L. Sun</i>
64	673	Mapping and understanding the human activity: a multilayer framework based on the ideomotor theory <i>C. Granata and P. Bidaud</i>
58	647	Deploying field robots for humanitarian demining: challenges, requirements and research trends <i>D. Portugal, L. Marques and M. Armada</i>
95	657	Agricultural derived machines for humanitarian demining: State of the art <i>G. A. Naselli, E. E. Cepolina, M. Przybylko, M. Zoppi and G. B. Polentes</i>
60	511	Stability study of underwater crawling robot on non-horizontal surface <i>H. Albitar, A. Ananiev and I. Kalaykov</i>

<b>Session – C2: Locomotion-3</b>		
<b>Session Chair: Krzysztof Walas</b>		
<b>Time: 10.40 – 12.40</b>		
<b>Venue: CW9</b>		
Paper ID	Proc Page	Presentation
56	393	Development of hexapod walking robot using straight type artificial muscle what can carry a load of 300[N] <i>R. Shimano, H. Tomori, T. Miyanaga and T. Nakamura</i>
84	425	Haptic foothold suitability identification and prediction for legged robots <i>M. Hoepflinger, M. Hutter, C. Gehring, M. Bloesch and R. Siegwart</i>
85	433	Robot-centric elevation mapping with uncertainty estimates <i>P. Fankhauser, M. Bloesch, C. Gehring, M. Hutter and R. Siegwart</i>
42	441	Chassis design of a mobile robot for reducing weight by excluding suspension elements <i>T. Okada, N. Mimura, T. Shimizu and H. Wada</i>
39	451	Influence of external vibration disturbances on a wall climbing robot with vacuum grippers <i>V. G. Gradetsky, M.M. Knyazkov, L. F. Fomin, A. N. Sukhanov and A. A. Kryukova</i>
7	665	CREA - A climbing robot with eleven vacuum adhesion chambers <i>D. Schmidt, S. Schütz, K. Berns, J. Ohr, D. Homeyer and C. Klaus</i>

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Session – G1: Robot ethics (plenary lectures)		
Session Chair: Endre Kadar		
Time: 14.00 - 15.40		
Venue: CW1		
Paper ID	Proc. Page	Presentation
105	715	G1.1 - Towards development of ethically compliant robots <i>M. O. Tokhi</i>
98	685	G1.2 - When children interact with robots: Ethics in the MONarCH project <i>I. Ferreira and J. Sequeira</i>
99	693	G1.3 - A normative extension for BDI agent model <i>M. Tufis and J.-G. Ganascia</i>
104	704	G1.4 - Revealing the 'face' of the robot - introducing the ethics of Levinas to the field of roboethics <i>B. Wohl</i>
x03		G1.5 - Discussing ethical guidelines for roboticists' research involving children <i>M. Kyriakidou</i>

Session – G2: Legged Robots Locomotion		
Session Chair: Krzysztof Kozłowski		
Time: 16.00 - 17.00		
Venue: CW1		
Paper ID	Proc. Page	Presentation
21	133	G2.1 - Homer's dream fulfilled -- robotic walking servants <i>T. Zielińska</i>
93	511	G2.2 - Robotic-enhanced rehabilitation of patients with ILIZAROV apparatus: preliminary study <i>P. Sauer, M. Drązkowska, K. Kozłowski, B. Krysiak, J. Majchrzak, D. Pazderski, M. Józwiak, P. Koczewski, M. Shadi and R. Hejna</i>
x02		G2.3 - Design and control of legged robots with compliant actuation <i>Marco Hutter, Mark Hoepflinger, Christian Gehring, Peter Fankhauser, Roland Siegwart</i>

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## Day -3: Wednesday 23 July 2014

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AND WALKING ROBOTS 21-23 JULY 2014

<b>Keynote Address – 4</b>		
<b>Session Chair: Giovanni Muscato</b>		
<b>Time: 09.00 – 10.00</b>		
<b>Venue: CW1</b>		
Paper ID	Proc Page	Presentation
3	39	Using kinematic redundancy to design fault tolerant robotic systems <i>Anthony A. Maciejewski</i>

<b>Session – A3: Innovative design of CLAWAR</b>		
<b>Session Chair: Christophe Grand</b>		
<b>Time: 10.20 – 12.40</b>		
<b>Venue: CW7</b>		
Paper ID	Proc. Page	Presentation
37	251	Inspection of floating platform mooring chains with a climbing robot <i>A. G. Ruiz, T. P. Sattar, M. C. Sanz and B. S. Rodriguez-Fillooy</i>
16	241	A novel resonant locomotion principle based on impact force for miniature mobile robot <i>J. Li, W. Li, H. Hu, C. Li, S. Yu, R. Sun and L. Sun</i>
12	233	An introduction into robot organisms based on CoSMO modules <i>J. Liedke and H. Wörn</i>
44	259	Friction optimized adhesion control of a wheel-driven wall-climbing robot <i>K. Kopietz, D. Schmidt, S. Schütz and K. Berns</i>
45	267	Design of a wheel-legged hexapod robot for creative adaptation <i>J.-M. Jehanno, A. Cully, C. Grand and J.-B. Mouret</i>
30	277	Printable modular robot: An application of rapid prototyping for flexible robot design <i>D. Krupke, F. Wasserfall, N. Hendrich and J. Zhang</i>
14		Different approaches to realise wheg-driven systems <i>M. Fremerey, S. Köhring, O. Nassar, M. Schöne, K. Weinmeister, H. Witte and G. Đorđević</i>

<b>Session – B3: Perception, localisation, planning and control</b>		
<b>Session Chair: Piotr Skrzypczynski</b>		
<b>Time: 10.20 – 12.40</b>		
<b>Venue: CW8</b>		
Paper ID	Proc. Page	Presentation
31	583	Efficient discontinuity filling in terrain maps for walking robot motion planning <i>P. Skrzypczynski</i>
81	591	Influence of walking speed and direction of movement on tactile ground classification process <i>K. Walas, M. Czachorowski and T. Halasz</i>
77	600	Inexpensive spatial position system for the automation of ultrasound NDT with mobile robots <i>M. A. Al Rashed and T. P. Sattar</i>
68	609	Tip-over stability-based path planning for a tracked mobile robot over rough terrains <i>J. Y. Jun and F. Benamar</i>
92	617	Stabilization of acrobot after landing <i>K. Kozłowski, M. Michalski and P. Parulski</i>
78	207	Design and motion planning of quadruped robotic platform <i>S. Raut, S. R. Kota and G. S. Virk</i>
62	401	A configuration optimization algorithm based on quasi-static approach for a UGV <i>E. Corral, J. Meneses, H. Rubio, C. Castejón and J. C. García-Prada</i>

<b>Session – C3: Sensing, actuation and assistive medical robots</b>		
<b>Session Chair: Giovanni Muscato</b>		
<b>Time: 10.20 – 12.40</b>		
<b>Venue: CW9</b>		
Paper ID	Proc. Page	Presentation
26	289	Linear electric actuator with a flexible hydraulic transmission <i>A. Safonov, V. Bilous, M. Boiko, U. Schmucker and A. Telesh</i>
73	297	Outdoor validation of an intelligent prodder for humanitarian demining with a mobile manipulator <i>S. Baglio, L. Cantelli, F. Giusa, G. Muscato and A. Noto</i>
75	305	Force and angle feedback prodder <i>R. Fernandez, H. Montes, J. Gusano, J. Sarria and M. Armada</i>
23	45	Joint parameter mapping method for the control of knee prosthesis <i>J. Li, W. Li, C. Li, H. Hu, H. Guo, S. Yu, R. Sun, L. Sun</i>
57	61	A load estimation of a patient considering with a posture during standing motion <i>T. Yamada, M. Sakaguchi, D. Chugo, S. Yokota and H. Hashimoto</i>
63	69	Using joint trajectories and time-scaling optimization for humanoid motion imitation of human beings <i>K. Munirathinam, S. Sakka and C. Chevallereau</i>
33	523	An analysis of a five-wheeled wheelchair for a static wheelie for climbing a step <i>Y. Munakata and M. Wada</i>

<b>14.00–14.20</b>	<b>Closure</b>
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