

2012 2nd International Conference on Applied Robotics for the Power Industry

(CARPI 2012)

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11 – 13 September 2012**



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Content List of 2nd International Conference on Applied Robotics for the Power Industry

Technical Program for Tuesday September 11, 2012

Tu1A	HG E7
Robotic Crawlers (Regular Session)	

Chair: Zwicker, Ekkehard ALSTOM Inspection Robotics

09:15-09:35 Tu1A.1

Wall Following for Autonomous Robot Navigation, pp. 1-4.

Imhof, Agnes Bern Univ. of Applied Sciences

Oetiker, Moritz ALSTOM Inspection Robotics Ltd

Jensen, Bjoern Bern Univ. of Applied Sciences

09:35-09:55 Tu1A.2

Automated Boiler Wall Cleaning and Inspection, pp. 5-9.

Zesch, Wolfgang Alstom Inspection Robotics Ltd.

Roth, Philipp Waterjet Tech. AG

Honold, Simon Alstom Switzerland Ltd.

de Vries, Vera Alstom Switzerland Ltd.

09:55-10:15 Tu1A.3

Climbing Robot for Corrosion Monitoring of Reinforced Concrete Structures, pp. 10-15.

Leibbrandt, Alexis ETH Zurich

Caprari, Gilles ETH Zurich

Angst, Ueli ETH Zurich

Sieglwart, Roland ETH Zurich

Flatt, Robert ETH Zurich

Elsener, Bernhard ETH Zurich

10:15-10:35 Tu1A.4

Noise Characterization of Depth Sensors for Surface Inspections, pp. 16-21.

Pomerleau, Francois ETH Zurich

Breitenmoser, Andreas ETH Zurich

Liu, Ming ETH Zurich

Colas, Francis ETH Zurich

Sieglwart, Roland ETH Zurich

10:35-10:55 Tu1A.5

Surface Reconstruction and Path Planning for Industrial Inspection with a Climbing Robot, pp. 22-27.

Breitenmoser, Andreas ETH Zurich

Sieglwart, Roland ETH Zurich

Tu2A	HG E7
Power Plant Maintenance (Regular Session)	

Chair: de Vries, Vera Alstom Switzerland Ltd.

11:15-11:35 Tu2A.1

Automated Abrasive Water Jet Pin Cutting System – Mark II, pp. 28-32.

Honold, Simon Alstom Switzerland Ltd

Roth, Philipp Waterjet Tech. AG

de Vries, Vera Alstom Switzerland Ltd.

11:35-11:55 Tu2A.2

Robotic Refurbishment of a Spherical Valve, pp. 33-38.

Hazel, Bruce Inst. de Recherche d'Hydro-Quebec

Bedwani, Jean-Luc IREQ, Hydro-Québec, Varennes, Canada

Laroche, Yvan Inst. de Recherche d'Hydro-Quebec

Mongenot, Patrick Inst. de Recherche d'Hydro-Quebec

Lavallée, Éric Inst. de Recherche d'Hydro-Quebec

Bédard, Laurie Énergie Électrique, Rio Tinto Alcan, Saguenay, Canada

Lavoie, Luc Énergie Électrique, Rio Tinto Alcan, Saguenay, Canada

Gagné, Jean-Louis Énergie Électrique, Rio Tinto Alcan, Saguenay, Canada

11:55-12:15 Tu2A.3

Development of an Automated System for Cavitation Repairing in Rotors of Large Hydroelectric Plants, pp. 39-44.

Simas, Henrique Univ. Federal de Santa Catarina

Golin, Julio Feller IFSC - Campus Geraldo Werninghaus

De Pieri, Edson Roberto Univ. Federal de Santa Catarina

Martins, Daniel Univ. Federal de Santa Catarina

12:15-12:35 Tu2A.4

Support of Power Plant Telemaintenance with Robots by Augmented Reality Methods, pp. 45-49.

Leutert, Florian Univ. Wuerzburg

Schilling, Klaus Univ. Wuerzburg

12:35-12:45 Tu2A.5

Robotic Polishing of Turbine Runners, pp. 50-51.

Sabourin, Michel Alstom Hydro Canada

Paquet, Francois Alstom Hydro Canada

Hazel, Bruce Inst. de Recherche d'Hydro-Quebec

Cote, Jean Inst. de Recherche d'Hydro-Quebec

Mongenot, Patrick Inst. de Recherche d'Hydro-Quebec

Tu3A	HG E7
Unmanned Aerial Vehicles 1 (Regular Session)	

Chair: Pradalier, Cedric ETH Zürich

15:10-15:30 Tu3A.1

Real-Time Power Line Extraction from Unmanned Aerial System Video Images, pp. 52-57.

Liu, Yuee Queensland Univ. of Tech.

Mejias, Luis Queensland Univ. of Tech.

15:30-15:50 Tu3A.2

An Embedded Module for Robotized Inspection of Power Lines by Using Thermographic and Visual Images, pp. 58-63.

Fetter Lages, Walter Federal Univ. of Rio Grande do Sul

Scheeren, Vinicius Federal Univ. of Rio Grande do Sul

15:50-16:10 Tu3A.3

Aerial Service Robotics: The AI Robots Perspective, pp. 64-69.

Marconi, Lorenzo Univ. of Bologna

Basile, Francesco Univ. of Salerno

Caprari, Gilles ETH Zurich

Carlioni, Raffaella Univ. of Twente

Chiacchio, Pasquale Univ. di Salerno

Huerzeler, Christoph ETH Zurich

Lippiello, Vincenzo Univ. di Napoli Federico II

Naldi, Roberto CASY-DEIS Univ. of Bologna

Nikolic, Janosch ETH

Siciliano, Bruno	Univ. di Napoli Federico II
Stramigioli, Stefano	Univ. of Twente
Zwicker, Ekkehard	ALSTOM Inspection Robotics
16:10-16:30	Tu3A.4
<i>Aerial Service Robots for Visual Inspection of Thermal Power Plant Boiler Systems</i> , pp. 70-75.	
Burri, Michael	ETH Zurich
Nikolic, Janosch	ETH Zurich
Huerzeler, Christoph	ETH Zurich
Caprari, Gilles	ETH Zurich
Sieewart, Roland	ETH Zurich
16:30-16:40	Tu3A.5
<i>Aerial Service Robots: An Overview of the AIRobots Activity</i> , pp. 76-77.	
Marconi, Lorenzo	DEIS-Univ. of Bologna
Naldi, Roberto	CASY-DEIS Univ. of Bologna
Torre, Alessio	Univ. of Bologna
Nikolic, Janosch	ETH
Huerzeler, Christoph	ETH Zurich
Caprari, Gilles	ETH Zurich
Zwicker, Ekkehard	ALSTOM Inspection Robotics
Siciliano, Bruno	Univ. di Napoli Federico II
Lippiello, Vincenzo	Univ. di Napoli Federico II
Carlioni, Raffaella	Univ. of Twente
Stramigioli, Stefano	Univ. of Twente

Oswaldo, Horikawa	Força e Luz Univ. of São Paulo
18:20-18:30	Tu4A.5
<i>Autonomous Overhead Transmission Line Inspection Robot (TI) Development and Demonstration</i> , pp. 94-95.	
Phillips, Andrew	Electric Power Res. Inst.
McGuire, Drew	Southern Company
Engdahl, Eric	American Electric Power
Major, Mark	Southwest Res. Inst.
Bartlett, Glynn	Southwest Res. Inst.

Tu4A	HG E7
Power Line Inspection 1 (Regular Session)	
Chair: Montambault, Serge	Hydro-Quebec
17:00-17:20	Tu4A.1
<i>A Survey of Applied Robotics for the Power Industry in Brazil</i> , pp. 78-82.	
Fetter Lages, Walter	Federal Univ. of Rio Grande do Sul
Oliveira, Vinicius	Federal Univ. of Rio Grande
17:20-17:40	Tu4A.2
<i>Robot for Inspection of Transmission Lines</i> , pp. 83-87.	
Fonseca Ribeiro, Alisson	Eletronbras Furnas
Abdo, Ricardo Fraga	Eletronbras Furnas
Alberto de Oliveira, João	Eletronbras Furnas
17:40-18:00	Tu4A.3
<i>Extended Applications of LineROVer Technology[†]</i> . ABDE	
Zhang, Feng	Shandong Electric Power Res. Inst.
Cao, Lei	Shandong Electric Power Res. Inst.
Guo, Rui	Shandong Electric Power Res. Inst.
Zhong, Liang	Shandong Electric Power Res. Inst.
Jia, Juan	Shandong Electric Power Res. Inst.
Jia, Yonggang	Shandong Electric Power Res. Inst.
Chi, Xiaoming	Shandong Electric Power Res. Inst.
18:00-18:20	Tu4A.4
<i>Pole Type Robot for Distribution Power Line Inspection</i> , pp. 88-93.	
Finotto, Vitor Cores	CTU, Prague
Hirakawa, Andre Riyuiti	Univ. of São Paulo
Chamas Filho, Alexandre	CPFL - Companhia Paulista de

Technical Program for Wednesday September 12, 2012

We1A		HG E7
Power Line Inspection 2 (Regular Session)		
Chair: Fetter Lages, Walter		Federal Univ. of Rio Grande do Sul
09:45-10:05		We1A.1
<i>Robotics for Distribution Power Lines: Overview of the Last Decade</i> , pp. 96-101.		
Allan, Jean-Francois		Hydro-Quebec Res. Inst.
10:05-10:25		We1A.2
<i>A Task Analysis and a Controller System Design for a Power Distribution Line Maintenance Robot</i> , pp. 102-107.		
Hida, Minoru		Meijo Univ.
He, Yingxin		Meijo Univ.
Yamamoto, Yusuke		Meijo Univ.
Maekawa, Naoki		Meijo Univ.
Tatsuno, Kyoichi		Meijo Univ.
Kunii, Yasuyuki		Chubu Electric Power Co., Inc.
10:25-10:45		We1A.3
<i>A Mobile Robot Prototype for Inspection of Overhead Bundled Conductors</i> , pp. 108-113.		
Guo, Rui		Shandong Electric Power Res. Inst.
Zhang, Feng		Shandong Electric Power Res. Inst.
Cao, Lei		Shandong Electric Power Res. Inst.
Zhong, Liang		Shandong Electric Power Res. Inst.
10:45-11:05		We1A.4
<i>AApe-D: A Novel Power Transmission Line Maintenance Robot for Broken Strand Repair</i> , pp. 108-113.		
Song, Yifeng		Shenyang Inst. of Automation and Graduate School of Chinese
Wang, Hongguang		Shenyang Inst. of Automation, Chinese Acad. of Sciences
Jiang, Yong		Shenyang Inst. of Automation, Chinese Acad. of Sciences
Ling, Lie		Shenyang Inst. of Automation, Chinese Acad. of Sciences
We2A		HG E7
Power Line Inspection 3 (Regular Session)		
Chair: Allan, Jean-Francois		Hydro-Quebec Res. Inst.
11:30-11:50		We2A.1
<i>Intelligent On-Line Monitoring System Based on Elastic Wave for Damage Inspection on Overhead Transmission Lines</i> , pp. 114-119.		
Chen, Hongtang		Shandong Electric Power Research Inst.
Guo, Rui		Shandong Electric Power Res. Inst.
Zhao, Jinlong		Electric Power Robotic Lab. Shandong Electric Power Research Inst.
Zhang, Feng		Shandong Electric Power Res. Inst.
Zhong, Liang		Shandong Electric Power Res. Inst.
11:50-12:10		We2A.2
<i>Obstacle Avoidance for a Power Line Inspection Robot</i> , pp. 114-119.		
Rowell, Timothy		Univ. of KwaZulu-Natal

Boje, Edward		Univ. of KwaZulu-Natal
12:10-12:30		We2A.3
<i>A Simple Robot Manipulator Able to Negotiate Power Line Hardware</i> , pp. 120-125.		
Lorimer, Trevor		Univ. of KwaZulu-Natal
Boje, Ed		Univ. of KwaZulu-Natal
12:30-12:40		We2A.4
<i>On the Latest Field Deployments of LineScout Technology on Live Transmission Networks</i> , pp. 126-127.		
Montambault, Serge		Hydro-Quebec
Pouliot, Nicolas		Hydro-Quebec
Lepage, Marco		Hydro-Québec
We3A		HG E7
Robotics for Nuclear Power Plants 1 (Regular Session)		
Chair: Garrec, Philippe		CEA
14:00-14:20		We3A.1
<i>Mini-invasive Robotic Diagnostics for Fusion Machines</i> , pp. 128-132.		
Gargiulo, Laurent		CEA
14:20-14:40		We3A.2
<i>An Adaptable and Self-Calibrating Service Robotic Scanner for Ultrasonic Inspection of Nuclear Nozzle-Vessel Welds</i> , pp. 133-138.		
Papadimitriou, Vasileios		Innora S.A.
Roditis, Ioannis		Innora S.A.
Chatzakos, Panagiotis		Innora S.A.
Liaptsis, Dimosthenis		TWI NDT Validation Centre
14:40-15:00		We3A.3
<i>Use of Robotic Equipment in a Canadian Used Nuclear Fuel Packing Plant</i> , pp. 139-144.		
Marinceu, Dimitrie		NWMO
Murchison, Alan		NWMO
Hatton, Chris		NWMO
We4A		HG E7
Robotics for Nuclear Power Plants 2 (Regular Session)		
Chair: Gargiulo, Laurent		CEA
15:10-15:30		We4A.1
<i>Flexible Multibody Dynamics and Control of a Novel Hydraulically Driven Hybrid Redundant Robot Machine</i> , pp. 145-150.		
Al-Saedi, Mazin		Lappeenranta Univ. of Tech.
Handroos, Heikki		Lappeenranta Univ. of Tech.
Wu, Huapeng		Lappeenranta Univ. of Tech.
15:30-15:50		We4A.2
<i>Robotics for Nuclear Power Plants – Challenges and Future Perspectives</i> , pp. 151-156.		
Iqbal, Jamshed		COMSATS Inst. of Information Tech. Islamabad
Tahir, Ahmad Mahmood		Lahore Univ. of Management Sciences, Lahore
Raza, Ul Islam		COMSATS Inst. of Information Tech. Islamabad
Riaz-un-Nabi, Syed		Italian Inst. of Tech. (IIT), Genova
15:50-16:10		We4A.3
<i>Results of a Testing Campaign of the Telerobotic System MT200-TAO in AREVA La Hague's Hot-Cells</i> , pp. 157-162.		
Garrec, Philippe		CEA
Geffard, Franck		CEA

Piolain, Gérard	AREVA, La Hague
Freudenreich, Anne-Gaëlle	AREVA, La Hague
Monthel, Pierre	AREVA, La Hague
Brudieu, Marie-Anne	AREVA, La Defense

We5A		HG E7
Power Substations (Regular Session)		
Chair: Pouliot, Nicolas		Hydro-Quebec Res. -IREQ
16:30-16:50		We5A.1
<i>The Application of Image Based Vision Servo System for SmartGuard[†]. IEEE</i>		
Li, Li	Electric Power Robotics Lab. Shandong Electric Power Res.	
Wang, Binhai	Electric Power Robotics Lab. Shandong Electric Power Res.	
Li, Beidou	Shandong luneng Intelligence Tech. Co., Ltd.,	
Wang, Zhenli	Shandong luneng Intelligence Tech. Co., Ltd.,	
Wang, Wanguo	Electric Power Robotics Lab. Electric Power Res.	
16:50-17:10		We5A.2
<i>Status Recognition of Isolator Based on SmartGuard[†]. IEEE</i>		
Wang, Wanguo	Electric Power Robotics Lab. Electric Power Res.	
Wang, Binhai	Electric Power RoboticsLaboratory,Shandong Electric Power Res.	
Wang, Zhenli	Electric Power RoboticsLaboratory,Shandong Electric Power Res.	
Li, Li	Electric Power RoboticsLaboratory,Shandong Electric Power Res.	
Zhang, Jingjing	Electric Power RoboticsLaboratory,Shandong Electric Power Res.	
Li, Hongyu	Electric Power RoboticsLaboratory,Shandong Electric Power Res.	
17:10-17:30		We5A.3
<i>Design of a Laser Navigation System for Substation Inspection Robot[†]. IEEE</i>		
Xiao, Peng	Shandong Electric Power Res. Inst.	
Guo, Rui	Shandong Electric Power Res. Inst.	
Wang, Shirong	Dali Power Supply Bureau, Yunnan Power Grid Corp.	
Luan, Yiqing	Shandong Electric Power Res. Inst.	
Wang, Mingrui	Shandong Electric Power Res. Inst.	

Technical Program for Thursday September 13, 2012

Th1A		HG E7
Unmanned Aerial Vehicles 2 (Regular Session)		
Chair: Alexis, Konstantinos		ETH Zurich
09:00-09:20		Th1A.1
<i>Planning Efficient and Robust Behaviors for Model-Based Power Tower Inspection</i> , pp. 163-166.		
Wu, Hua	North China Electric Power Univ.	
Lv, Min	North China Electric Power Univ.	
Liu, Chang-An	North China Electric Power Univ.	
Liu, Chun-Yang	North China Electric Power Univ.	
09:20-09:40		Th1A.2
<i>Applying Aerial Robotics for Inspections of Power and Petrochemical Facilities</i> , pp. 167-172.		
Huerzeler, Christoph		ETH Zurich
Zwicker, Ekkehard	ALSTOM Inspection Robotics	
Caprari, Gilles		ETH Zurich
Marconi, Lorenzo		Univ. of Bologna
09:40-10:00		Th1A.3
<i>AiSR - Aerial Intelligent Surveillance Robot for Power Line Inspection</i> [†] . AI-DE		
Khoo, Chin Peng Ivan	Abacus Global Tech. Pte Ltd	
Li, De Li	Abacus Global Tech. Pte Ltd	
Yin, Hsiang Ting	Abacus Global Tech. Pte Ltd	
10:00-10:20		Th1A.4
<i>The Design and Application of SmartCopter: An Unmanned Helicopter Based Robot for Transmission Line Inspection</i> [†] . AI-DE		
Wang, Binhai	Shandong Electric Power Res. Inst.	
Wang, Qian	Shandong Electric Power Res. Inst.	
Liu, Liang	Shandong Electric Power Res. Inst.	
Tian, Gangyin	Beijing Tuoyunhai Tech. Co., Ltd.	
Zheng, Tianru	Shandong Electric Power Res. Inst.	
Zhang, Jingjing	Shandong Electric Power Res. Inst.	
Chen, Xiguang	Shandong Electric Power Res. Inst.	
10:20-10:30		Th1A.5
<i>Inspecting Transmission Lines with an Unmanned Fixed-Wings Aircraft</i> , pp. 173-174.		
Dong, Gang	Shandong Electric Power Corp.	
Chen, Xiguang	Shandong Electric PowerResearch Inst.	
Wang, Binhai	Shandong Electric PowerResearch Inst.	
Zhang, Jingjing	Electric Power Robotics Lab. Shandong Electric PowerResea	
Liu, Liang	Electric Power Robotics Lab. Shandong Electric PowerResea	
Wang, Qian	Electric Power Robotics Lab. Shandong Electric PowerResea	
Wei, Chuanhu	Electric Power Robotics Lab. Shandong ElectricPowerResear	

Th2A		HG E7
Robotics for Inspection (Regular Session)		
Chair: Hazel, Bruce		Inst. de Recherche

		d'Hydro-Quebec
10:50-11:10		Th2A.1
<i>Redesign of a Scanner for EC and UT-Measurements in the Central Bores of Large Rotors in Power Plants – with Focus on an Electromechanically Actuated Leg-Unit for Passing Steps in Bottle-Bores without Using Pneumatic Actuation</i> , pp. 175-180.		
Fischer, Wolfgang		Alstom Inspection Robotics
Loosli, Dominik		Alstom Inspection Robotics
Udell, Chris		Alstom Power
11:10-11:30		Th2A.2
<i>Design and Field Validation of a Large-Volume Reference System for Inspecting Underwater Hydroelectric Structures</i> , pp. 181-186.		
François, Mirallès		Hydro-Quebec Res. Inst.
Guillaume, Boivin		Hydro-Quebec Res. Inst.
11:30-11:50		Th2A.3
<i>Prototyping and Evaluation of a Telerobot for Remote Inspection of Offshore Wind Farms</i> , pp. 187-192.		
Netland, Øyvind		Norwegian Univ. of Science and Tech.
Skavhaug, Amund		Norwegian Univ. of Science and Tech.
11:50-12:10		Th2A.4
<i>The 'DIRIS' Class of In-Situ Generator Inspection Systems</i> , pp. 193-196.		
Fischer, Reinhard		Alstom Switzerland Ltd
Fischer, Wolfgang		Alstom Inspection Robotics
Honold, Simon		Alstom Switzerland Ltd
Loosli, Dominik		Alstom Inspection Robotics
12:10-12:30		Th2A.5
<i>Localization and Archiving of Inspection Data Collected on Power Lines Using LineScout Technology</i> , pp. 197-202.		
Pouliot, Nicolas		Hydro-Quebec Res. -IREQ
Mussard, Didier		Hydro-Québec Res. Inst. – IREQ
Montambault, Serge		Hydro-Quebec