

# **2014 3rd International Conference on Applied Robotics for the Power Industry**

**(CARPI 2014)**

**Foz do Iguassu, Brazil  
14-16 October 2014**



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## October 14, 2014 — Tuesday

<b>08:30–09:00</b> <b>Registration</b>	Maringá Room
<b>09:00–09:30</b> <b>Opening Cerimony</b>	Londrina Room
<b>09:30–10:30</b> <b>Technical Session I</b> <b>Robots for Power Plants</b>	Londrina Room
Chair: John Lindberg	EPRI
09:30–09:50	2
<b>Robotic Systems applied to Power Substations - A State-of-the-art Survey</b> Jean-Francois Allan and Julien Beaudry (Hydro-Quebec (IREQ))	
09:50–10:10	21
<b>Mobile Robot for Inspection of Porcelain Insulator Strings</b> Zhong liang and Jia juan (Shandong Luneng Intelligence Technology Co.,Ltd) and Guo Rui (State Grid Shandong Electric Power Research Institute)	
10:10–10:30	10
<b>State of the Art of Computer Vision for the Management of Power Transmission Lines</b> François Mirallès, Nicolas Pouliot, and Serge Montambault (Hydro-Quebec Research Institute)	
<b>10:30–10:50</b> <b>Coffee-break</b>	
<b>10:50–12:10</b> <b>Technical Session II</b> <b>Underwater Robotics</b>	Londrina Room
Chair: Renato Ventura Bayan Henriques	UFRGS
10:50–11:10	3
<b>A New Compact Solution for the Rapid Measurement of Underwater Gate Guides</b> François Mirallès and Guillaume Boivin (Hydro-Quebec Research Institute)	
11:10–11:30	9
<b>Prototype of Water Wall Tubes Inspection Robot</b> Thavida Maneewarn and Kaned Thung-Od (Institute of Field Robotics (FIBO)King Mongkut University of Technology Thonburi Bangkok,Thailand) and Arsit Boonyaprapasorn (Dept. of Mechanical Engineering Chulachomkiao Royal Military Academy Nakorn Nayok, Thailand)	
11:30–11:50	15
<b>High speed Machining with a Robot for Hydraulics Turbines Maintenance</b> Vincent Delalande and Pierre-Henri Sauzeat (EDF)	

11:50–12:10 18  
**Simulation Environment of an Architecture for Mission Control System of AUVs operating in Lakes of Hydroelectric Dams**

Sandro Battistella (State University of Western Parana (UNIOESTE)) and Max Hering de Queiroz (Federal University of Santa Catarina (UFSC))

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**12:10–14:00** Brasserie 4 Estações  
**Lunch**

**14:00–15:40** Londrina Room  
**Technical Session III**  
**Robots for Inspection I**

Chair: Carlos Henrique Farias dos Santos UNIOESTE

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14:00–14:20 4  
**Remote Controlled Vehicle for Inspection of Vertical Concrete Structures**

John Lindberg and Maria Guimaraes (Electric Power Research Institute)

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14:20–14:40 14  
**Automatic Detection of Cracks During Power Plant Inspection**

Stephen J. Schmutge, N. Rich Nguyen, and Cua Thao (Department of Computer Science, UNC Charlotte), John Lindberg, Robert Grizzi, and Chris Joffe (Electric Power Research Institute), and Min C. Shin (Department of Computer Science, UNC Charlotte)

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14:40–15:00 26  
**Modelling and Control of a Power Supply for a Power Line Inspection Robot**

Edward Boje (University of Cape Town)

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15:00–15:20 37  
**Towards Autonomous Mine Inspection**

Pascal Gohl (Skybotix AG and ETH Zürich), Michael Burri (ETH Zurich), Sammy Omari (Skybotix AG and ETH Zürich), and Markus Achtelik and Roland Siegwart (ETH Zürich)

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15:20–15:40 44  
**Corrosion Detection Robot for Energized Power Lines**

Celio Fonseca Barbosa and Flávio Eduardo Nallin (CPqD)

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**15:40–16:10**  
**Coffee-break**

**16:10–17:50** Londrina Room  
**Technical Session IV**  
**Robots for Maintenance**

Chair: Renato Ventura Bayan Henriques UFRGS

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16:10–16:30 6  
**Robotics for maintenance in a Small Modular Reactor**

Sol Pedre, Alexandre Semine, Tobias Quispe Mamani, Alejandro Nunia, Enrique Boroni, Alexander Leño, Chars Sheider Trujillo, and Luis Rovere (CAB - CNEA)

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16:30–16:50	13
<b>Robotic Post-Weld Heat Treatment Using Induction Heating for In-Situ Repair of Martensitic Stainless Steel Turbine Runners</b>	
Bruce Hazel, Eric Boudreault, Jean Côté, and Stéphane Godin (IREQ)	
16:50–17:10	29
<b>Non-Conducting Manipulator for Live-Line Maintenance: Use of Pneumatic Artificial Muscles</b>	
William Scaff, Andre Riyuiti Hirakawa, and Oswaldo Horikawa (Polytechnic School of Sao Paulo University)	
17:10–17:30	36
<b>Automatic Elevator for Assisting Maintenance of Distribution Power Line - Control System</b>	
William Scaff, Renan Augusto Pavani, Victor Sverzuti, Ivo da Paz Lopes, Oswaldo Horikawa, and André Riyuiti Hirakawa (Polytechnic School of São Paulo University) and Alexandre Chamas Filho, Antonio Palmiro Fujita, and Ednilson José Menatti (Paulista Power and Light Company)	
17:30–17:50	17
<b>Wheeled Robot for Cleaning Power Lines</b>	
Farshid Abbasi, Rebecca Oglesby, Javad Mohammadpour, and Zion Tse (Complex Systems Controls Lab, College of Engineering, The University of Georgia) and Drew McGuire (Southern Company)	
<b>18:00-20:00</b>	Carmen Miranda Room
<b>Networking Cocktail</b>	

## October 15, 2014 — Wednesday

<b>08:30–09:00</b> <b>Registration</b>	Maringá Room
<b>09:00–10:20</b> <b>Technical Session V</b> <b>Robots for Inspection II</b>	Londrina Room
Chair: Walter de Brito Vital Filho	UnB
09:00–09:20	27
<b>Safe Flight Envelope for Overhead Line Inspection</b> Sandra Antunes (Albatroz Engenharia) and Kouamana Bousson (Universidade da Beira Interior)	
09:20–09:40	22
<b>PipeTron Series - Robots for Pipe Inspection</b> Paulo Debenest, Michele Guarnieri, and Shigeo Hirose (HiBot)	
09:40–10:00	23
<b>A Mobile Robot for Inspection of Overhead Transmission Lines</b> Guo Rui (State Grid Shandong Electric Power Research Institute) and Zhang Feng and Cao Lei (Shandong Luneng Intelligent Technology Co., Ltd.)	
10:00–10:20	25
<b>Double Conical Wheels Based Mobile Robot for Aerial Power Distribution Lines Inspection</b> Renan Augusto Pavani, William Scaff, Andre Riyuiti Hirakawa, and Oswaldo Horikawa (Escola Politécnica of the University of São Paulo) and José Francisco Resende (ELEKTRO)	
<b>10:20–10:40</b> <b>Coffee-break</b>	
<b>10:40–12:00</b> <b>Technical Session VI</b> <b>UAVs</b>	Londrina Room
Chair: Andre Riyuiti Hirakawa	EP-USP
10:40–11:00	39
<b>Road Edge and Obstacle Detection on the SmartGuard Navigation System</b> Li Li (State Grid Shandong Electric Power Research Institute; Shandong Luneng Intelligence Technology Co., Ltd.)	
11:00–11:20	40
<b>VTOL Aerial Robot for Inspection of Transmission Line</b> Walter de Britto Vidal Filho and Andre Murilo Almeida Pinto (UnB)	

11:20–11:40 30

**Industrial Inspection Using Aerial Robots**

Sammy Omari and Pascal Gohl (ETH Zurich / Skybotix AG), Michael Burri and Markus Achtelik (ETH Zurich), and Roland Siegwart (EHT Zurich)

11:40–12:00 28

**Unmanned Vehicles Network: Platforms and Software Toolchain**

João Tasso de Figueiredo Borges de Sousa (Faculdade de Engenharia da Universidade do Porto) and Breno Carneiro Pinheiro and Ubirajara Franco Moreno (Departamento de Automação e Sistemas-UFSC)

**12:00–14:00**

Brasserie 4 Estações

**Lunch**

**14:00–15:40**

Londrina Room

**Technical Session VII**

**Robot Design**

Chair: Celio Fonseca Barbosa

CPqD

14:00–14:20

32

**Task-oriented Mechanical Design of the AApe Power Line Robots**

Hongguang Wang and Yifeng Song (Shenyang Institute of Automation, Chinese Academy of Sciences, P.R.China)

14:20–14:40

33

**A Specialized Robotic System Prototype for Repairing Surface Profiles of Hydraulic Turbine Blades**

José Maurício S T Motta, Guilherme Caribé de Carvalho, Carlos Humberto Llanos-Quintero, and Sadek C. Absi-Alfaro (University of Brasilia/Dept. Mechanical Engineering/Brazil)

14:40–15:00

34

**A Survey of Applied Robotics for Tree Pruning Around Overhead Power Lines**

Luciano C. Siebert, Luiz F. R. B. Toledo, Pedro A. B. Block, and Diogo B. Dahlke (LACTEC Institutes), Ronaldo A. Roncolato (FEERGS Tools and Equipment), and Dailton P. Cerqueira (COELBA - Electricity Company of Bahia)

15:00–15:20

49

**New Concept for Development of Project for Robot in Inspection of Transmission Lines**

Joao Alberto de Oliveira and Alisson Fonseca Ribeiro (Furnas Centrais Eletricas S.A.)

15:20–15:40

48

**An Integrated Approach for the Non-Destructive Testing of ACSR Conductors: Early Deployments of Robotized Sensors**

Nicolas Pouliot, Eric Lavoie, Gilles Rousseau, and Serge Montambault (Hydro-Québec Research Institute - IREQ)

**15:40–16:10**

**Coffee-break**

<b>16:10–17:30</b>	Londrina Room
<b>Technical Session VIII</b>	
<b>Robots for Inspection III</b>	
Chair: Paulo Debenest	HiBot
16:10–16:30	59
<b>Brachiating Power Line Inspection Robot</b>	
Javaad Patel and Edward Boje (University of Cape Town)	
16:30–16:50	45
<b>An Eddy Current Sensor for Conductor Inspection on Energized Power Lines</b>	
Celio Fonseca Barbosa (CPqD)	
16:50–17:10	43
<b>Thermographic Inspection Using a Microcontrolled Camera Positioning System</b>	
Daniel Julien Barros da Silva Sampaio, Victor Gomes Soares de Sousa, Daniel Rubbo, Alan Fagundes Costa, and Ruben Glatt (UNESP - Univ. Estadual Paulista - Campus Guaratinguetá)	
17:10–17:30	12
<b>Visual Detection for Power Line Fault and Obstacle on a Maintenance Robot</b>	
Yifeng Song (Shenyang Institute of Automation, University of Chinese Academy of Sciences) and Hongguang Wang (Shenyang Institute of Automation)	
<b>19:30-23:00</b>	Churrascaria Rafain
<b>Conference Banquet</b>	

## October 16, 2014 — Thursday

<b>08:30–09:00</b> <b>Registration</b>	Maringá Room
<b>09:00–09:40</b> <b>Keynote Session</b>	Londrina Room
09:00–09:40	47
<b>Hydro-Québec’s Power Line Robotics Program: 15 years of Developments, Implementation and Partnerships</b>	
Serge Montambault and Nicolas Pouliot (Hydro-Québec’s Research Institute - IREQ)	
<b>09:40–10:00</b> <b>Coffee-break</b>	
<b>10:00–11:00</b> <b>Technical Session IX</b> <b>Video Session</b>	Londrina Room
Chair: Sol Pedre	Comisión Nacional de Energía Atómica
10:00–10:30	5
<b>Inspection in Cluttered Space with a Continuum Manipulator</b>	
Jinglin Li and Jing Xiao (UNC Charlotte) and Robert Grizzi and John Lindberg (EPRI)	
10:30–11:00	42
<b>Electrical Substation Inspection and Intervention Robot, Field Experiments</b>	
Julien Beaudry and Jean-Francois Allan (Hydro-Quebec (IREQ))	
<b>11:00–13:00</b> <b>Lunch</b>	Brasserie 4 Estações
<b>13:00–17:30</b> <b>Technical Visit</b>	Itaipu hydro-generating power plant
<b>Rules for the technical visit:</b>	
1. Due to the rules of access to industrial area, visitors are required to be at least 14 years old.	
2. It is compulsory to wear closed shoes (without heels), and clothing with length below the knee.	
3. Purses, backpacks or bags are prohibited. If necessary, there are lockers for rent.	
4. Cameras, camcorders and personal belongings such as glasses, cell phone, wallet, keys, etc. are allowed.	
<b>17:30–18:00</b> <b>Closing Ceremony</b>	Londrina Room
<b>18:00–20:00</b> <b>Farewell Reception</b>	