

# **2007 IEEE International Workshop on Safety, Security and Rescue Robotics**

**Rome, Italy  
27-29 September 2007**



**IEEE Catalog Number:**  
**ISBN 10:**  
**ISBN 13:**

**CFP07SSR-PRT**  
**1-4244-1568-3**  
**978-1-4244-1568-7**

# Table of Contents

<b>Development of Small-Size Multi Camera System for Snake-like Robot, and Display of Wide View-Angle Image.....</b>	<b>1</b>
<i>Naoki Midorikawa, Kazunori Ohno, Hiroyuki Kuwahara, Satoshi Tadokoro</i>	
<b>Improved Reel Mechanism to Wind a Cable Uniformly in Spherical Trailer .....</b>	<b>7</b>
<i>Masayuki Arai, Shigeo Hirose</i>	
<b>Auxiliary Motive Power for TerminatorBot: An Actuator Toolbox .....</b>	<b>13</b>
<i>Richard M. Voyles, Roy Godzdanker, Tae-Ho Kim</i>	
<b>AWARE: Platform for Autonomous Self-Deploying and Operation of Wireless Sensor-Actuator Networks Cooperation with Unmanned Aerial Vehicles .....</b>	<b>18</b>
<i>Anibal Ollero, Markus Bernard, Marco La Civita, Lodewijk van Hoesel, Pedro J. Marron, Jason Lepley, Eduardo de Andres</i>	
<b>Extracting Terrain Features from Range Images for Autonomous Random Stepfield Traversal .....</b>	<b>24</b>
<i>Raymond Sheh, M. Waleed Kadous, Claude Sammut, Bernhard Hengst</i>	
<b>Fast Detection of Polygons in 3D Point Clouds from Noise-Prone Range Sensors .....</b>	<b>30</b>
<i>Narunas Vaskevicius, Andreas Birk, Kaustubh Pathak, Jann Poppinga</i>	
<b>Autonomous Perception Techniques for Urban and Industrial Fire Scenarios .....</b>	<b>36</b>
<i>J. Capitan, D. Mantecon, P. Soriano, A. Ollero</i>	
<b>Mapping Disaster Areas Jointly: RFID-Coordinated SLAM by Humans and Robots .....</b>	<b>42</b>
<i>Alexander Kleiner, Christian Dornhege, Sun Dali</i>	
<b>Building Multilevel Planar Maps Integrating LRF, Stereo Vision and IMU Sensors .....</b>	<b>48</b>
<i>Luca Iocchi, Stefano Pellegrini, Gian Diego Tipaldi</i>	
<b>Using the Unscented Kalman Filter in Mono-SLAM with Inverse Depth Parametrization for Autonomous Airship Control .....</b>	<b>54</b>
<i>Niko Sunderhauf, Sven Lange, Peter Protzel</i>	
<b>A Haptically Enabled Low-Cost Reconnaissance Platform for Law Enforcement.....</b>	<b>60</b>
<i>James Mullins, Ben Horan, Mick Fielding, Saeid Nahavandi</i>	
<b>Fully Autonomous Operations of a Jacobs Rugbot in the RoboCup Rescue Robot League 2006.....</b>	<b>66</b>
<i>Kaustubh Pathak, Andreas Birk, Soren Schwertfeger, Ivan Delchef, Stefan Markov</i>	
<b>A Three-Tier Hierarchical Robotic System for Urban Search and Rescue Applications .....</b>	<b>72</b>
<i>D.A. Carnegie</i>	
<b>Development of ALACRANE: A Mobile Robotic Assistance for Exploration and Rescue Missions.....</b>	<b>78</b>
<i>A. Garcia-Cerezo, A. Mandow, J.L. Martinez, J. Gomez-de-Gabriel, J. Morales, A. Cruz, A. Reina, J. Seron</i>	
<b>Adaptive Kalman Filtering for GPS-based Mobile Robot Localization .....</b>	<b>84</b>
<i>Giulio Reina, Andres Vargas, Keiji Nagatani, Kazuya Yoshida</i>	
<b>Personal Dead-Reckoning System for GPS-Denied Environments .....</b>	<b>90</b>
<i>Lauro Ojeda, Johann Borenstein</i>	
<b>Using a Mini-UAV to Support Wilderness Search and Rescue: Practices for Human-Robot Training .....</b>	<b>96</b>
<i>Micheal A. Goodrich, Joseph L. Cooper, Julie A. Adams, Curtis Humphrey, Ron Zeeman, Brian G. Buss</i>	
<b>Autonomous Control of a Shape-Shifting Robot in Urban Terrain .....</b>	<b>102</b>
<i>Bin Li, Shugen Ma, Jinguo Liu, Yuechao Wang</i>	
<b>A Mixed Terrestrial Aerial Robotic Platform for Volcanic and Industrial Surveillance.....</b>	<b>108</b>
<i>D. Longo, D. Melita, G. Muscato, S. Sessa</i>	
<b>Use of a Robot Platoon to Implement Mobile Ad-hoc Network in Rescue Scenario - Preliminary Experimental Results.....</b>	<b>114</b>
<i>Gianluca Antonelli, Filippo Arrichiello, Stefano Chiaverini, Simone Contrafatto, Roberto Setola</i>	

# Table of Contents

<b>Performance Analysis of the Network Models for the Search Robot Rescue System in the Closed Spaces .....</b>	<b>120</b>
<i>Koichi Gyoda, Yasushi Hada, Osamu Takizawa</i>	
<b>Stable Navigation Solutions for Robots in Complex Environments.....</b>	<b>126</b>
<i>C. Scrapper, R. Madhavan, S. Balakirsky</i>	
<b>Localization Using Triangulation in Swarms of Autonomous Rescue Robots .....</b>	<b>132</b>
<i>Daniel P. Stormont, Aliasgar Kutiyawala</i>	
<b>Methods and Techniques for Intelligent Navigation and Manipulation for Bomb Disposal and Rescue Operations .....</b>	<b>138</b>
<i>Carlos Beltran-Gonzalez, Antonios Gasteratos, Roberto Guzman, Andras Toth, Angelos Amanatiadis, Dimitrios Chrysostomou, Lorand Szollosi, Andras Juhasz, Peter Galambos</i>	
<b>Search for Survivors Buried in Rubble by Rescue Radar with Array Antennas - Extraction of Respiratory Fluctuation .....</b>	<b>144</b>
<i>Iwaki Akiyama, Natsuki Yoshizumi, Akihisa Ohya, Yoshimitsu Aoki, Fumitoshi Matsuno</i>	
<b>OzBot™ - Haptic Augmentation of a Teleoperated Robotic Platform for Search and Rescue Operations .....</b>	<b>150</b>
<i>Michael Fielding, James Mullins, Ben Horan, Saeid Nahavandi</i>	
<b>Safe Human-Robot Interaction in a Life Science Environment .....</b>	<b>156</b>
<i>Markus Fritzsche, Erik Schulenburg, Norbert Elkmann, Angelika Girstl, Stefan Stiene, Christian Teutsch</i>	
<b>Exploration Transform: A Stable Exploring Algorithm for Robots in Rescue Environments.....</b>	<b>162</b>
<i>Stephan Wirth, Johannes Pellenz</i>	
<b>Optimized Octtree Data Structure and Access Methods for 3D Mapping .....</b>	<b>167</b>
<i>Jann Poppinga, Max Pfingsthorn, Soren Schwertfeger, Kaustubh Pathak, Andreas Birk</i>	
<b>Extraction of Semantic Floor Plans from 3D Point Cloud Maps .....</b>	<b>173</b>
<i>Vytenis Sakenas, Olegas Kosuchinas, Max Pfingsthorn, Andreas Birk</i>	
<b>An Autonomous Aerial Vehicle for Unmanned Security and Surveillance Operations: Design and Test.....</b>	<b>179</b>
<i>G. Belloni, M. Feroli, A. Ficola, S. Pagnottelli, P. Valigi</i>	
<b>FUMA: Platform Development and System Integration for Rescue Missions .....</b>	<b>183</b>
<i>Noritaka Sato, Fumitoshi Matsuno, Naoji Shiroma</i>	
<b>Development and Control Method of Six-Wheel Robot with Rocker Structure.....</b>	<b>189</b>
<i>Keiji Nagatani, Ayato Yamasaki, Kazuya Yoshida, Tadashi Adachi</i>	
<b>Object Oriented Network Control of Wheeler - The Hyper Mobile Inspection Robot .....</b>	<b>195</b>
<i>Michal Pytasz, Grzegorz Granosik</i>	
<b>Novel Robot for Safety Protection, Identification &amp; Detection .....</b>	<b>199</b>
<i>Ding Xilun, Paul, Cristina, Rovetta Alberto, Wang Zhiying</i>	
<b>Virtual 360° Panorama for Remote Inspection .....</b>	<b>202</b>
<i>Mattias Seeman, Mathias Broxvall, Alessandro Saffiotti</i>	
<b>An Online Bayesian Classifier for Object Identification.....</b>	<b>207</b>
<i>Daniel P. Stormont</i>	