

Mechatronics & Machine Vision in Practice

13th Annual International
Conference on Mechatronics
and Machine Vision in Practice
2006

December 5-7, 2006
Toowoomba, Australia

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 978-1-60560-087-1

Some format issues inherent in the e-media version may also appear in this print version.

Some of the papers in these proceedings have also (after slight re-editing) been published in "Mechatronics and Machine Vision in Practice" by Springer, and can be found at the following web address:

<http://www.springer.com/engineering/book/978-3-540-74026-1>

Mechatronics & Machine Vision in Practice

13th Annual International Conference on
Mechatronics and Machine Vision in Practice
2006

TABLE OF CONTENTS

| | |
|---|------------|
| Emergent Behaviour Real-time Programming of a Six-Legged Omni-Directional Mobile Robot: Planning of Viennese Waltz Behaviour | 1 |
| <i>Frank Nickols</i> | |
| Non-linear Observer for Slip Estimation of Tracked Vehicles..... | 13 |
| <i>Z.B. Song, Y.H. Zweiri, K. Althoefer, L.D. Seneviratne</i> | |
| Development of an Intelligent Physiotherapy System..... | 24 |
| <i>S.L. Chen, W.B. Lai, T.H. Lee, K.K. Tan</i> | |
| Design and Implementation of a Four Rotor Helicopter and Study of Its Ability | 30 |
| <i>J. Toledo, M. Sigut, L. Acosta, J. Felipe, S. Torres, E. J. Gonzalez</i> | |
| Machine Vision for Beer Keg Asset Management | 36 |
| <i>Michael Lees, Duncan Campbell, Andrew Keir</i> | |
| Particle Size Determination in Granular Images Using Edge Detection with Application to Agricultural Products | 45 |
| <i>Ronald Elunai, Vinod Chandran</i> | |
| Millimetre Wave Radar Visualisation System: Practical Approach to Transforming Mining Operations..... | 51 |
| <i>E. Widzyk-Capehart, G. Brooker, S. Scheduling, A. Maclean, R. Hennessy, C. Lobsey, M. Sivadurai</i> | |
| Visual Position Estimation for Automatic Landing of a Tail-Sitter Vertical Takeoff and Landing Unmanned Air Vehicle | 60 |
| <i>Allen C. Tsai, Peter W. Gibbens, R. Hugh Stone</i> | |
| A Vision System for Depth Perception That Uses Inertial Sensing and Motion Parallax..... | 70 |
| <i>V Bećanović, XB Wang</i> | |
| Minutiae-based Fingerprint Alignment Using Phase Correlation | 78 |
| <i>Weiping Chen, Yongsheng Gao</i> | |
| Intelligent Approach to Cordblood Collection | 84 |
| <i>S. Chen, K.K. Tan, S. Huang, K.Z. Tang</i> | |
| The Hong Kong Underwater Robot Challenge..... | 90 |
| <i>Robin Bradbeer</i> | |
| Modelling Pneumatic Muscles As Hydraulic Muscles for Use As an Underwater Actuator | 98 |
| <i>Kenneth, K.K.Ku, Robin Bradbeer</i> | |
| Coordination in Mechatronic Engineering Work | 106 |
| <i>James Trevelyan</i> | |
| Sensing Objects on a Belt Conveyor Using an Ultrasonic Rangefinder Array and Neural Net Based Data Processing | 117 |
| <i>Changwoo Ha, Yongtae Do</i> | |

| | |
|---|-----|
| On-the-go Machine Vision Sensing of Cotton Plant Geometric Parameters: First Results | 123 |
| <i>Cheryl McCarthy, Nigel Hancock, Steven Raine,</i> | |
| QTAR: Quad-Thrust Aerial Robot | 130 |
| <i>Joshua N Portlock, Samuel N Cubero</i> | |
| An Autonomous Surgical Robot Applied in Practice | 144 |
| <i>P.N.Brett, R.P.Taylor, D.Proops, M.V.Griffiths, C.Coulson</i> | |
| Direct Kinematics of 3DOF Planar Parallel Mechanisms: A Discussion | 151 |
| <i>Denny Oetomo, Hwee Choo Liaw, Gursel Alici, Bijan Shirinzadeh, Yongmin Zhong</i> | |
| Advanced 3D Imaging Technology for Autonomous Manufacturing Systems | 164 |
| <i>A. Pichler, H. Bauer, C. Eberst, C. Heindl, J. Minichberger</i> | |
| Deformable Object Simulation with Fluid Model | 177 |
| <i>Yongmin Zhong, Bijan Shirinzadeh, Julian Smith</i> | |
| Vision Based Person Tracking and Following in Unstructured Environments | 192 |
| <i>Mahmoud Tarokh, John Kuo</i> | |
| Machine Vision Application for Machined Components Surface Roughness Assessment in the Micro- and Nano-Scale Regions | 203 |
| <i>Ghassan A. Al-Kindi, Bijan Shirinzadeh, Yongmin Zhong</i> | |
| Project-Oriented Low Cost Autonomous Underwater Vehicle with Servo-visual Control for Mechatronics Curricula | 215 |
| <i>C. A. Cruz-Villar , V. Parra-Vega, A. Rodriguez-Angeles</i> | |
| A Power and Bandwidth Efficient Remote Wireless Video Surveillance System Using Joint Source-Channel Coding | 221 |
| <i>Wei Xiang</i> | |
| A Display Framework for Presenting Information from a Visual Prosthesis | 230 |
| <i>Jason Dowling , Wageeh Boles, Anthony Maeder</i> | |
| Simple, Robust and Accurate Head-Pose Tracking Using a Single Camera | 236 |
| <i>Simon Meers, Koren Ward, Ian Piper</i> | |
| Mobile Robot Navigation using Alpha Level Fuzzy Logic System: Theoretical and Experimental Investigations | 248 |
| <i>S. Parasuraman , V. Ganapathy, Bijan Shirinzadeh, Yongmin Zhong</i> | |
| More Machine Vision Applications in the NCEA | 254 |
| <i>John Billingsley</i> | |

Author Index