

6th International Conference on Quality Control by Artificial Vision

Organizing Committee:

Conference Chair: **Dr. Kenneth Tobin, Jr.**, Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA
Co-chair: **Prof. Fabrice Meriaudeau**, University of Burgundy, Le Creusot, France

International Scientific Committee:

Chair: Prof. Philippe Bolon, University of Savoie, France
Co-chair: Dr. Jeffery Price, Oak Ridge National Laboratory, USA

Monday 19 May

12:00-1:30pm: WORKING LUNCH – Organizing Committee (Garden View A and B)
3:00-6:30pm: On-site Registration and Reception (Mountain View)

Tuesday 20 May

Welcome and Opening Remarks8:45am (Ballroom 3 and 4)
Kenneth W. Tobin, Jr., Oak Ridge National Laboratory

Keynote Address9:00am
Imaging: From Research to Commercialization, Ralph
Gonzalez [ORNL-078]

SESSION 01 – Location: Ballroom 3

Image Processing, Segmentation, And Feature Analysis I *Chair: K. W. Tobin*

10:00am: **Framework For Industrial Visual Surface Inspections** (*Invited Paper*), Olli Silvén and Matti Niskanen, Machine Vision Group, University of Oulu, Finland. [ORNL-081]

10:30am: **Real-time, Image Analysis of Living Cellular-Biology Measurements of Intelligent Chemistry**, James C. Solinsky, Scott E. Budge, Paul D. Majors, and Bruce Rex, Pacific Northwest National Laboratory, Richland, WA, Visiting Professor, Utah State University, Logan, UT. [ORNL-082]

11:00am **Constraining Deformable Templates For Shape Recognition**, Teresa Aixut, Ecole Polytechnique Fédérale de Lausanne, Switzerland. [ORNL-010] {Presented By Yuri De Meneses}

11:30am: **Characterization Of Morphological Evolution Of Plants (Forsythia) By Image Analysis Under Water Stress Conditions**, Philippe Foucher, Institut National d'horticulture, France. [ORNL-18]

LUNCH (Ballroom 1 and 2)12:00 to 1:30pm

SESSION 01 – Location: Ballroom 4

Vision Sensors And Systems, I *Chair: P. Bolon*

10:00am: **Development Of A Distributed Vision System For Industrial Conditions**, Michael Weiss, Paul O'Leary, and Arnulf Schiller, Institute for Automation, University of Leoben, Austria. [ORNL-020]

10:30am: **Real-Time Video Tracking Using PTZ Cameras**, Sangkyu Kang, Andreas Koschan, Besma Abidi, and Mongi A. Abidi, University of Tennessee, USA. [ORNL-34] {Presented By Besma Abidi}

11:00am: **A Correlation Retina In Standard 0.6µm: Application In Positioning System**, O. Aubret, L.F.C. Lew

Yan Voon, B. Lamalle, G. Cathebras, P. Gorria, and B. Bellach, Université de Bourgogne, France. [ORNL-39]

LUNCH (Ballroom 1 and 2)12:00 to 1:30pm

SESSION 2 – Location: Ballroom 3

Image Processing, Segmentation, And Feature Analysis, II

Chair: P. Gorria

1:30pm **Pattern Wafer Segmentation**, Pierrick Bourgeat, Fabrice Meriaudeau, Kenneth Tobin, and Patrick Gorria, Oak Ridge National Laboratory, USA and Le2I Laboratory – University of Burgundy, France. [ORNL-083]

2:00pm **Design Of Experiments To Set Active Contours**, Jean-Jacques Roussells and Nicole Vincent, Laboratoire d'Informatique, France. [ORNL-048]

2:30pm **Color Image Segmentation To Detect Defects On Fresh Ham**, Pascale Marty-Mahé, Philippe Loisel, Didier Brossard, Unité de Recherche Technologie des Equipements Agro-alimentaires, France. [ORNL-015] {Presented by Guylaine Collewet}

Coffee Break3:00pm

SESSION 3 – Location: Ballroom 3

**Image Processing, Segmentation,
And Feature Analysis, III**

Chair: O. Silven

3:30pm: **Application Of Scalable Discrepancy Measures For Computer Vision Image Segmentation Tasks**, Boubakeur Belaroussi, Christophe Odet, and Hugues Benoit-Cattin, Creatis, UMR CNRS #5515, France. [ORNL-055]

4:00pm: **Development Of Evaluation Method For Concrete Crack**, Seiji Hata, Akira Mizobuchi, and Tadashi Inai, Kagawa University and Tadano Co. Ltd, Japan. [ORNL-054] {Presented by Hayashi}

4:30pm: **Application Of Fractal Encoding Techniques For Image Segmentation**, Regina K. Ferrell, Shaun S. Gleason and Kenneth W. Tobin, Oak Ridge National Laboratory, USA. [ORNL-077]

SESSION 2 – Location: Ballroom 4

Vision Sensors And Systems, II

Chair: R. K. Ferrell

1:30pm: **CMOS Image Sensor Design For Speed Determination Of Fast Moving Luminous Objects**, Benaissa Bellach, Lew F.C. Lew Yan Voon, Bernard Lamalle and Guy Cathebras, Université de Bourgogne, France. [ORNL-059]

2:00pm: **Two Methods For Tracking Small Animals In SPECT Imaging**, Ryan Kerekes, Shaun Gleason and James Goddard, Oak Ridge National Laboratory, USA. [ORNL-075]

2:30pm: **Preliminary Validation Of A Fabric Smoothness Assessment System**, Christopher N. Turner, Hamed Sari-Sarraf, Eric Hequet, and Sunho Lee, Texas Tech University, USA. [ORNL-036]

Coffee3:00pm

SESSION 3 – Location: Ballroom 4

Vision Sensors And Systems, III

Chair: S. S. Gleason

3:30pm: **Optical Coherence Tomography Evaluation Of Internal Random Structure Of Wood Fiber Tissue**, Igor Gurov, Erkki Alarousu, Jukka Hast, Risto Myllylä, Insitute of Fine Mechanics and Optices, Russia and University of Oulu, Finland. [ORNL-027]

4:00pm: **Estimation Of The Luminance Map For Lambertian Photometric Model: Application To The Study Of A Road Surface Roughness**, Majdi Khoudeir, Brochard Jacques, Min-Tan Do, and Vincent Legeay, Laboratoire IRCOM-SIC, UMR-CNRS 6615, Université de Poitiers, France and Laboratoire Central des Ponts et Chaussées, France.[ORNL-023] {Presented by a Substitute Speaker}

Wednesday 21 May

Welcome and Opening Remarks8:45am (Ballroom 3 and 4)
Kenneth W. Tobin, Jr., Oak Ridge National Laboratory

Plenary Speaker9:00am
Automatic Design of Morphological Operators, Edward
Dougherty, [ORNL-080]

SESSION 1 – Location: Ballroom 3

Feature Analysis And Pattern Recognition, I

Chair: P. Bolon

10:00am: **Cascade System, Genetic Algorithm – Multi-Layer Neural Network, For A Supervised Classification Of Texture Images**, M. Nasri, R. Aboutni, M. El Hitmy, H. Natt Charif, M. Barboucha, Ecole Supérieure de Technologie, Morocco. [ORNL-002]

10:30am: **Comparison Of Dimensionality Reduction Methods For Wood Surface Inspection**, Matti Niskanen and Olli Silvén, University of Oulu, Finland. [ORNL-004]

11:00am: **Using A CBIR Scheme Based On Experts Knowledge For A Computer-Aided Classification Of Ornamental Stones**, Mohamed-Chaker Larabi, Noël Richard, Olivier et Colot, and Christine Fernandez, Université de Poitiers, France. [ORNL-071]

11:30am: **Content-Based Retrieval Of Surface Defect Images With MPEG-7 Descriptors**, Jussi Pakkanen and Jukka Iivarinen, Helsinki University of Technology, Finland. [ORNL-056]

LUNCH (Ballroom 1 and 2)12:00-1:30pm

SESSION 2 – Location: Ballroom 3

Feature Analysis And Pattern Recognition, II

Chair: H. Sari-Sarraf

1:30pm: **Semiconductor Sidewall Shape Estimation Using Top-Down CD-SEM Image Retrieval**, Jeffery Price, Philip Bingham, Kenneth Tobin, and Thomas Karnowski, Oak Ridge National Laboratory, USA. [ORNL-073]

2:00pm: **Optimization Of A Fuzzy Classification By Evolutionary Strategies**, M. Nasri, M. El Hitmy, H. Ouariachi, and M. Barboucha, Ecole Supérieure de Technologie, Morocco. [ORNL-003]

Coffee Break3:00pm

SESSION 1 – Location: Ballroom 4

3-D Imaging Methods And Systems, I

Chair: R. K. Ferrell

10:00am: **Superquadrics Based 3D Object Representation Of Automotive Parts Utilizing Part Decomposition**, Y. Zhang, A. Koschan, and M. Abidi, University Tennessee Knoxville, USA. [ORNL-35]

10:30am: **Range Image Binarization: Applications To Wooden Stamps Analysis**, Ralph Seulin, Olivier Morel, Gilles Millon, and Frédéric Nicolier, LE2I and LAM, France. [ORNL-049]

11:00am: **Automated Determination of Regions of Interest for 3D Vision-based Quality Control of Free-Form Surfaces**, Alex Lallement, Pierre Graebbling and Ernest Hirsch, Université Louis Pasteur, France. [ORNL-052]

11:30am: **3D Visualization Of Skin Inner Tissue From Confocal Microscopic Images**, Jiahui Wang, Hideo Saito, Shinji Ozawa, Tomohiro Kuwahara, Toyounobu Yamashita, and Motoji Takahashi, KEIO University, Japan. [ORNL-067]

LUNCH (Ballroom 1 and 2)12:00-1:30pm

SESSION 2 – Location: Ballroom 4

3-D Imaging Methods And Systems, II

Chair: F. Truchetet

1:30pm: **Three Dimensional Tracking Of Human Eye**, Rémy Leconge, Olivier Lalignant, and Alain Diou, Université de Bourgogne, France. [ORNL-061] {Presented by a Substitute Speaker}

2:00pm: **Modeling 3D Objects From Range Maps And Color Images Using A Warping-Based Approach**, Faysal Boughorbel, Andreas Koschan, and Mogi Abidi, University of Tennessee, USA. [ORNL-030]

2:30pm: **Characterization Of The 3-D Information Of Calyptogena Shells**, Olivier Morel, Christophe Stolz, Frédéric Truchetet, Bruno David, Thérèse Cloné, and Eric Verrecchia, Université de Bourgogne, France. [ORNL-024]]

Coffee Break3:00pm

Wednesday 21 May
POSTER SESSION – *Location: Garden View C, D, and E*
3:30 – 6:00pm

- 1) **Quantization Of Polyphenolic Compounds In Histological Sections Of Grape Berries By Automated Color Image Analysis**, Alain Clement and Bertrand Vigouroux, Institut Universitaire de Technologie, France. [ORNL-005] {Presented By Philippe Foucher}
- 2) **Directional Structures Detection Using Steerable Pyramid**, Florence Denis and Atilla Baskurt, Université Claude Bernard Lyon1, France. [ORNL-019] {Presented By Boubakeur Belaroussi}
- 3) **Real-Time Image Segmentation For Anomalies Detection Using SVM Approximation**, S. Bouillant, J. Mitéran, M. Paindavoine, E. Bourennane, Université de Bourgogne, France. [ORNL-025] {Presented By Pierrick Bourgeat}
- 4) **Face Recognition: Evaluation Report For Faceit® Identification And Surveillance**, Jingu Heo, Besma Abidi, Joonki Paik, and Mongi Abidi, University of Tennessee, USA. [ORNL-032]
- 5) **Age And Gender Estimation By Modeling Statistical Relationship Among Faces**, Takayuki Fujiwara and Hiroyasu Koshimizu, Chukyo University, Japan. [ORNL-042]
- 6) **TV-Screen Quality Inspection By Artificial Vision**, Judit Martínez, Eva Costa, Paco Herreros, Antonio López and Juan José Villanueva, Universitat Autònoma de Barcelona, Spain. [ORNL-014]
- 7) **Grayscale Enhancement Techniques For X-ray Images Of Carry-On Luggage**, Besma Abidi, Mark Mitckes, Mongi Abidi, and Jimin Lian, University of Tennessee, USA. [ORNL-029]

6:00pm: DINNER/AWARDS CEREMONY (Ballroom 1 and 2)

Thursday 22 May

Welcome and Opening Remarks 8:45am (Ballroom 3 and 4)
Kenneth W. Tobin, Jr., Oak Ridge National Laboratory

Plenary Speaker 9:00am
**Quality Control By Artificial Vision: A Unifying View
With Applications In Desktop Printing**, Jan Allebach,
[ORNL-079]

SESSION 1 – Location: Ballroom 3

Process Automation, Characterization, And Control, I
Chair: *K. W. Tobin*

10:00am: **Vision-Based Automatic Process Control In Layered Manufacturing**, Yuan Cheng and Mohsen Jafari, Rutgers University, USA. [ORNL-013]

10:30am: **Visual Servo Control Using Orthonormal Polynomial**, Hamid Tairi, Tadeusz Sliwa, Yvon Voisin, Alain Diou and Larbi Radouane, Université de Bourgogne, France. [ORNL-058]

11:00am: **Scene Inspection Using A Robotic Imaging System**, Balaji Ramadoss, Jin-Choon Ng, Andreas Koschan, and Mongi Abidi, University of Tennessee, USA. [ORNL-031] {Presented By David Page}

11:30am: **Cognitive Intelligent Sensory System For Vision-Based Quality Control**, Sophie Kohler and Ernest Hirsch, Université Louis Pasteur, France. [ORNL-051]

LUNCH (Ballroom 1 and 2) 12:00-1:30pm

SESSION 2 – Location: Ballroom 3

Process Automation, Characterization, And Control, II
Chair: *P. Bingham*

1:30pm: **Texture-Based Paper Characterization Using Non-Supervised Clustering**, Markus Turtinen, Matti Pietikäinen, Olli Silvén, Topi Mäepää and Matti Niskanen, University of Oulu, Finland. [ORNL-008]

2:00pm: **Calibration And Quality Control Of Cherries By Artificial Vision**, F. Poupeau, C. Rosenberger, H. Laurent, B. Emile, J. Fachaux, ENSI de Bourges – Laboratory of Vision and Robotic, France. [ORNL-026] {Presented by Emile}

Coffee Break 3:00pm

SESSION 1 – Location: Ballroom 4

Special Session: Image Analysis For Face Identification
Chair: *H. Koshimizu*

10:00am: **Detection Of The Face And Eye Region For Drivers' Support System**, Isamu Takai, Kazuhiko Yamamoto, Kunihito Kato, Keiichi Yamada, and Michinori Andoh, Gifu University, Japan. [ORNL-028]

10:30am: **Head Pose Calibration From 3D Range And Texture Images For 3D Facial Caricaturing**, Takayuki Fujiwara and Hiroyasu Koshimizu, Chukyo University, Japan. [ORNL-041]

11:00pm: **Comparison Of Different Methods For Gender Estimation From Face Image Of Various Poses**, Yohei Ishii, Hitoshi Hongo, Yoshinori Niwa, and Kazuhiko Yamamoto, Gifu University, Japan. [ORNL-017]

11:30am: **Interactive Facial Caricaturing System Based On Eye Camera**, Tsuyoshi Yamaguchi, Masafumi Tominaga, and Hiroyasu Koshimizu, Chukyo University and Softopia, Japan. [ORNL-057]

LUNCH (Ballroom 1 and 2) 12:00-1:30pm

SESSION 2 – Location: Ballroom 4

Non-Optical Image Measurement And Analysis
Chair: *R. K. Ferrell*

1:30pm: **Quality Analysis Of Blue-Veined Cheeses By MRI. A Preliminary Study**, Alexandru Onea, Guylaine Collewet, Christine Fernandez-Maloigue, Constantin Vertan, and Francois Mariette, Cemagret and Université de Poitiers, France. [ORNL-016]

2:00pm: **Combination Of X-Ray Imaging And Spectra Measurements For Improving Automatic Inspection Of Aluminum Cast Components**, Valérie Kaftandjian, Gwenaële Lecomte, Emmanuelle Cendre, and Joergen Rheinlander, INSA-CNDRI Laboratory, France and RISOE National Laboratory, Denmark. [ORNL-053] {Presented by Jean-Michel Letang}

2:30pm: **Optimal Calibration Via Virtual X-Ray Imaging For Dual-Energy Techniques: Application To Glass Wool**, J. M. Létang, N. Freud, and G. Peix, INSA-Lyon Scientific & Technical University, France. [ORNL-062]

Coffee Break 3:00pm

SESSION 3 – Location: Ballroom 3

Color and Multispectral Image Analysis

Chair: S. Jaiswal

3:30pm: **Development Of A Multispectral Imagery Device Devoted To Weed Detection**, Jean-Baptiste Vioix, Jean-Paul Douzals, Frédéric Truchetet, and Pierre Navar, ENESAD – Cemagref and Laboratoire LE2I, France. [ORNL-069]

4:00pm: **Inspection Of Poultry Skin Tumor Using Hyperspectral Fluorescence Imaging**, Seong G. Kong, University of Tennessee, USA. [ORNL-012]

4:30pm: **Quality Indexing By Machine Vision During Fermentation In Black Tea Manufacturing**, S. Borah and M. Bhuyan, Tezpur University, India. [ORNL-007]

5:00pm: **Analysis Of A Large Set Of Color Spaces For Skin Pixel Detection In Color Images**, Jean-Christophe Terrillon, Arnaud Pilpre, Yoshinori Niwa, and Kazuhiko Yamamoto, Softopia Japan Foundation and Gifu University, Japan. [ORNL-050]

5:30pm: **The Treatment Of Colour Images Taken By An Endoscopic Camera In Order To Characterize The Grain Size Distribution Of A Soil**, P. Breul, R. Gourvés, P. Bonton, and Y. Haddani, Université Blaise Pascal, and Sol Solution, France. [ORNL-047]

SESSION 3 – Location: Ballroom 4

Non-Destructive Test And Analysis

Chair: H. Sari-Sarraf

3:30pm: **Detection Of Cavitation Pits On Steel Surfaces Using SEM Imagery**, Jeffery Price, Kathy W. Hylton, Kenneth W. Tobin, Jr., Philip R. Bingham, John D. Hunn, and John R. Haines, Oak Ridge National Laboratory, USA. [ORNL-070] {Presented by Karnowski}

4:00pm: **Characterization Of Gas Pipeline Flaws Using Wavelet Analysis**, Raymond Tucker, Steve Kerrel Venugopal K. Varma, Oak Ridge National Laboratory, USA. [ORNL-72]

4:30pm: **Optical Wear Assessment System For Grinding Tools**, Thomas Heger and Madhukar Pandit, University of Kaiserslautern, Germany. [ORNL-011]

5:00pm: **Lock-In Thermography To Rapid Evaluation Of Destruction Area In Composite Materials Used In Military Applications**, Waldemar Swiderski DSc, Military Institute of Armament Technology, Poland. [ORNL-066]