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# 2019 15th International Conference on Signal-Image Technology & Internet-Based Systems (SITIS) SITIS 2019

## Table of Contents

Foreword .....	xvii
Track Messages .....	xviii
Workshop Messages .....	xx
Organizing Committee .....	xxxii
Track Program Committees .....	xxxiv
Workshop Program Committees .....	xxxvi
Keynotes .....	xlvi
Acknowledgement .....	li

## TRACK SIVT: Signal Image and Vision Technologies

Improved Palmprint Segmentation for Robust Identification and Verification .....	1
<i>Dane Brown (Rhodes University) and Karen Bradshaw (Rhodes University)</i>	
Detecting Finger-Vein Presentation Attacks Using 3D Shape & Diffuse Reflectance Decomposition .....	8
<i>Jag Mohan Singh (Norwegian Biometrics Laboratory, NTNU), Sushma Venkatesh (Norwegian Biometrics Laboratory, NTNU), Kiran B. Raja (Norwegian Biometrics Laboratory, NTNU), Raghavendra Ramachandra (Norwegian Biometrics Laboratory, NTNU), and Christoph Busch (Norwegian Biometrics Laboratory, NTNU)</i>	
Visual Navigation Using a Webcam Based on Semantic Segmentation for Indoor Robots .....	15
<i>Miho Adachi (Meiji University), Sara Shatari (Meiji University), and Ryusuke Miyamoto (Meiji University)</i>	
Unsupervised Novelty Detection in Video with Adversarial Autoencoder Based on Non-Euclidean Space ...	22
<i>Jin-Young Kim (Yonsei University, South Korea) and Sung-Bae Cho (Yonsei University, South Korea)</i>	
An Efficient Dense Network for Semantic Segmentation of Eyes Images Captured with Virtual Reality Lens .....	28
<i>Andres Valenzuela (Universidad Andres Bello), Claudia Arellano (Universidad Andres Bello), and Juan Tapia (Universidad Tecnologica de Chile)</i>	
Proposition of Convolutional Neural Network Based System for Skin Cancer Detection .....	35
<i>Esther Chabi Adjomo (Institute of Mathematics and Physics Sciences Benin; University of Burgundy), Amadou Tidjani Sanda Mahama (Institute of Mathematics and Physics Sciences Benin; University of Burgundy), Pierre Gouton (Université de Bourgogne), and Joël Tossa (Institute of Mathematics and Physics Sciences Benin)</i>	

An Adaptive Background Modelling Method Based on Modified Running Averages .....	40
<i>Nahlah Algethami (National University of Ireland Galway) and Sam Redfern (National University of Ireland Galway)</i>	
Deterministic vs. Random Initializations for K-Means Color Image Quantization .....	50
<i>Henryk Palus (Silesian University of Technology) and Mariusz Frackiewicz (Silesian University of Technology)</i>	
Enhanced Morphological Filtering for Wavelet-Based Change-point Detection .....	56
<i>Mattia Stasolla (Royal Military Academy) and Xavier Neyt (Royal Military Academy)</i>	
An Investigation of Denoising Parameters Choice in two Perona-Malik Models .....	61
<i>Andrey Nasonov (Lomonosov Moscow State University), Nikolay Mamaev (Lomonosov Moscow State University), and Andrey Krylov (Lomonosov Moscow State University)</i>	
Dehazing with Recovery Level Map: Suppressing Over-Enhancement and Residual Haze .....	67
<i>Kentaro Iwamoto (Osaka University), Hiromi Yoshida (Kindai University), and Youji Iiguni (Osaka University)</i>	
Low-Light Image Enhancement via Adaptive Shape and Texture Prior .....	74
<i>Kazuki Kurihara (Osaka University), Hiromi Yoshida (Kindai University), and Youji Iiguni (Osaka University)</i>	
Light-Weight Visual Feature Based Labeling (LVFL) for Unsupervised Person Re-identification .....	82
<i>Sridhar Raj S (National Institute of Technology, Tiruchirappalli &amp; Institute for Development and Research in Banking Technology (IDRBT), India), M V N K Prasad (Institute for Development and Research in Banking Technology (IDRBT), India), and Ramadoss Balakrishnan (National Institute of Technology, Tiruchirappalli)</i>	
Performance Comparison of Deep Learning Based Face Identification Methods for Video Under Adverse Conditions .....	90
<i>Galip Pala (Marmara University) and Cigdem Eroglu Erdem (Marmara University)</i>	
Multi-angled Face Segmentation and Identification Using Limited Data .....	98
<i>Dane Brown (Rhodes University)</i>	
Robust Morph-Detection at Automated Border Control Gate Using Deep Decomposed 3D Shape & Diffuse Reflectance .....	106
<i>Jag Mohan Singh (Norwegian Biometrics Laboratory, NTNU, Norway), Raghavendra Ramachandra (Norwegian Biometrics Laboratory, NTNU, Norway), Kiran B. Raja (Norwegian Biometrics Laboratory, NTNU, Norway), and Christoph Busch (Norwegian Biometrics Laboratory, NTNU, Norway)</i>	
Face Recognition - A One-Shot Learning Perspective .....	113
<i>Sukalpa Chanda (Østfold University College), Asish Chakrapani GV (Indian Statistical Institute), Anders Brun (Uppsala University), Anders Hast (Uppsala University), Umapada Pal (Indian Statistical Institute), and David Doermann (University at Buffalo)</i>	
Visible to Band Gender Classification: An Extensive Experimental Evaluation Based on Multi-spectral Imaging .....	120
<i>Narayan Vetrekar (Goa University), Raghavendra Ramachandra (NTNU), Kiran Raja (NTNU), Sushma Venkatesh (NTNU), Rajendra Gad (Goa University), and Christoph Busch (NTNU)</i>	

# Visible to Band Gender Classification: An Extensive Experimental Evaluation Based on Multi-spectral Imaging

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1

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## Abstract

### Document Sections

I. Introduction

II. Database

III. Methodology

IV. Experiments  
and Results

VI. Conclusion

## Authors

## Figures

## References

## Citations

## Keywords

## Metrics

### Abstract:

The ability of multi-spectral imaging to acquire spatial and spectral details across electromagnetic spectrum, has gained significant importance to perform under varying illumination conditions. Due to which a maximum preference is shown in the recent times to employ multi-spectral imaging in biometric systems. Although there are substantial studies carried out independently using visible image face database and multi-spectral face database operated in several bands, the visible to band gender classification is still an open problem. In this paper, we present gender classification, thereby training the Support Vector Machine (SVM) classifier model using visible face images and testing independently using individual band images for analysis. We evaluate the proposed approach on 79750 sample images which comprises of multi-spectral face database and newly introduced visible face database to present the importance of this study. The extensive evaluation results in the form of average classification accuracy is presented by using 10 fold cross-validation method. The highest average classification accuracy of  $95.96 \pm 1.68\%$  demonstrates the applicability of visible to band comparison approach for gender classification.

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## I. Introduction

Soft biometric based on face can help in predicting the useful set of demographic or forensic information such as gender, age, ethnicity, height, weight, skin color, etc [1]–[3]. Essentially, in any biometric identification/verification system, gender is considered as an important characteristic

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