

# **2019 32nd SIBGRAPI Conference on Graphics, Patterns and Images (SIBGRAPI 2019)**

**Rio de Janeiro, Brazil  
28 – 31 October 2019**



**IEEE Catalog Number: CFP19129-POD  
ISBN: 978-1-7281-5228-8**

**Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP19129-POD
ISBN (Print-On-Demand):	978-1-7281-5228-8
ISBN (Online):	978-1-7281-5227-1
ISSN:	1530-1834

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# 2019 32nd SIBGRAPI Conference on Graphics, Patterns and Images (SIBGRAPI) **SIBGRAPI 2019**

## Table of Contents

Message from the General Chairs .....	x
Message from the Program Chairs .....	xi
Conference Organization .....	xii
Sponsors .....	xvi

### TS1: Action and Video Recognition

Video Segmentation Learning Using Cascade Residual Convolutional Neural Network .....	1
<i>Daniel F. S. Santos (São Paulo State University), Rafael G. Pires (São Paulo State University), Danilo Colombo (Petroleo Brasileiro S.A. - Petrobras), and João P. Papa (São Paulo State University)</i>	
Fight Detection in Video Sequences Based on Multi-Stream Convolutional Neural Networks .....	8
<i>Sarah Almeida Carneiro (University of Campinas), Gabriel Pellegrino da Silva (University of Campinas), Silvio Jamil F. Guimaraes (Pontifical Catholic University of Minas Gerais), and Helio Pedrini (University of Campinas)</i>	
Skeleton Image Representation for 3D Action Recognition Based on Tree Structure and Reference Joints.....	16
<i>Carlos Caetano (Universidade Federal de Minas Gerais), François Brémond (INRIA), and William Robson Schwartz (Universidade Federal de Minas Gerais)</i>	
CV-C3D: Action Recognition on Compressed Videos with Convolutional 3D Networks .....	24
<i>Samuel Felipe dos Santos (Universidade Federal de São Paulo), Nicu Sebe (University of Trento), and Jurandy Almeida (Universidade Federal de São Paulo)</i>	

### TS2: Visualization Techniques and Applications

Generating Audiovisual Summaries from Literary Works using Emotion Analysis .....	31
<i>Daniela F. Milon-Flores (Universidad Católica San Pablo), Jose Ochoa-Luna (Universidad Católica San Pablo), and Erick Gomez-Nieto (University of Sao Paulo)</i>	

eSTIME: Towards an All-in-One Geovisualization Environment for Daily Mobility Analysis .....	39
<i>Aline Menin (Univ. Grenoble Alpes, CNRS, Grenoble INP, LIG), Sonia Chardonnel (Univ. Grenoble Alpes, CNRS, Science Po Grenoble, PACTE), Paule-Annick Davoine (Univ. Grenoble Alpes, CNRS, Science Po Grenoble, PACTE and Grenoble INP, LIG), and Luciana Nedel (Federal University of Rio Grande do Sul)</i>	

## TS3: Biomedical Image Analysis

Acquisition of Digital Images and Identification of Aedes Aegypti Mosquito Eggs using Classification and Deep Learning .....	47
<i>Pedro Saint Clair Garcia (Federal University of Ouro Preto), Rafael Martins (Federal University of Ouro Preto), George Luiz Lins Machado Coelho (Federal University of Ouro Preto), and Guillermo Cámara-Chávez (Federal University of Ouro Preto)</i>	
Low-Dose CT Dental Image Denoising by Morphological Operators and 3D Filtering .....	54
<i>Romulo Marconato Stringhini (Federal University of Santa Maria), Daniel Welfer (Federal University of Santa Maria), Marcos Cordeiro d'Ornellas (Federal University of Santa Maria), and Daniel Fernando Tello Gamarra (Federal University of Santa Maria)</i>	
Long-Range Decoder Skip Connections: Exploiting Multi-Context Information for Cardiac Image Segmentation .....	60
<i>Nicolás Gutierrez-Castilla (San Pablo Catholic University), Ricardo da S. Torres (University of Campinas), Alexandre X. Falcão (University of Campinas), Sebastian Kozerke (ETH Zurich), Jürg Schwitler (Lausanne University Hospital), Pier-Giorgio Masci (King's College London), and Javier A. Montoya-Zegarra (ETH Zurich)</i>	
CAD System for Breast US Images with Speckle Noise Reduction and Bio-Inspired Segmentation .....	68
<i>Paulo S. S. Rodrigues (Centro Universitário FEI), Guilherme A. Wachs Lopes (Centro Universitário FEI), Gilson A. Giraldo (National Laboratory for Scientific Computing), Celia A. Z. Barcelos (Federal University of Uberlandia), Luciana Vieira (Federal University of Uberlandia), Denise Guliato (Federal University of Uberlandia), and Bikesh Kumar Singh (National Institute of Technology Raipur)</i>	
Fast and Smart Segmentation of Paraspinal Muscles in Magnetic Resonance Imaging with CleverSeg .....	76
<i>Jonathan S. Ramos (University of São Paulo), Mirela T. Cazzolato (University of São Paulo), Bruno S. Faiçal (University of São Paulo), Oscar A. C. Linares (University of São Paulo), Marcello H. Nogueira-Barbosa (University of São Paulo), Caetano Traina Jr. (University of São Paulo), and Agma J. M. Traina (University of São Paulo)</i>	

## TS4: Visualization

Comparing the Effectiveness of Visualizations of Different Data Distributions .....	84
<i>Ariane M. B. Rodrigues (PUC-Rio), Gabriel D. J. Barbosa (PUC-Rio), Hélio Lopes (PUC-Rio), and Simone D. J. Barbosa (PUC-Rio)</i>	

Robust and Effective Method for Automatic Generation of One-Dimensional Transfer Functions .....	92
<i>Rustam Mesquita (Tecgraf/PUC-Rio Institute) and Waldemar Celes (Tecgraf/PUC-Rio Institute)</i>	

## TS5: Image Processing

Exploring Hierarchy Simplification for Non-Significant Region Removal .....	100
<i>Isabela Borlido Barcelos (Pontifical Catholic University of Minas Gerais), Gabriel Barbosa da Fonseca (Pontifical Catholic University of Minas Gerais), Laurent Najman (Université Paris-Est, LIGM UMR), Yukiko Kenmochi (Université Paris-Est, LIGM UMR), Benjamin Perret (Université Paris-Est, LIGM UMR), Jean Cousty (Université Paris-Est, LIGM UMR), Zenilton K. G. do Patrocínio Jr. (Pontifical Catholic University of Minas Gerais), and Silvio Jamil F. Guimarães (Pontifical Catholic University of Minas Gerais)</i>	
The Importance of Object-Based Seed Sampling for Superpixel Segmentation .....	108
<i>Felipe Belém (University of Campinas), Leonardo Melo (University of Campinas), Silvio Guimarães (Pontifical Catholic University of Minas Gerais), and Alexandre Falcão (University of Campinas)</i>	
Solving Tangram Puzzles Using Raster-Based Mathematical Morphology .....	116
<i>Fernanda Miyuki Yamada (Federal University of ABC), João Paulo Gois (Federal University of ABC), and Harlen Costa Batagelo (Federal University of ABC)</i>	
Exploring Double Cross Cyclic Interpolation in Unpaired Image-to-Image Translation .....	124
<i>Jorge López (Universidad Católica San Pablo), Antoni Mauricio (Universidad Católica San Pablo), and Guillermo Cámara (Federal University of Ouro Preto)</i>	

## TS6: Geometry and Animation

GPU-Based Rendering of Arbitrarily Complex Cutting Surfaces for Black Oil Reservoir Models .....	131
<i>Bernardo Franceschin (Tecgraf/PUC-Rio Institute), Frederico Abraham (Tecgraf/PUC-Rio Institute), Luiz Felipe Netto (Tecgraf/PUC-Rio Institute), and Waldemar Celes (Tecgraf/PUC-Rio Institute)</i>	
A Partition Approach to Interpolate Polygon Sets for Animation .....	139
<i>Alexandre Ribeiro Cajazeira Ramos (Federal University of Ceara), Emanuele Santos (Federal University of Ceara), and Joaquim Bento Cavalcante Neto (Federal University of Ceara)</i>	
Energy Embedded Gauss-Seidel Iteration for Soft Body Simulations .....	147
<i>Ozan Cetinaslan (Universidade do Porto) and Rafael Oliveira Chaves (Federal University of Pará &amp; State University of Pará)</i>	

## TS7: Pattern Recognition I

RetailNet: A Deep Learning Approach for People Counting and Hot Spots Detection in Retail Stores .....	155
<i>Valério Nogueira Jr. (Federal University of Alagoas), Hugo Oliveira (Federal University of Alagoas), José Augusto Silva (Federal University of Alagoas), Thales Vieira (Federal University of Alagoas), and Krerley Oliveira (Federal University of Alagoas)</i>	

Face Recognition Using LBP on an Image Transformation Based on Complex Network Degrees .....	163
<i>Murilo Villas Boas da Costa (Uberlandia Federal University), Cynthia Martins Villar Couto (Sao Paulo University), and Leandro Nogueira Couto (Uberlandia Federal University)</i>	
Multi-Loss Recurrent Residual Networks for Gesture Detection and Recognition .....	170
<i>Igor L. O. Bastos (Universidade Federal de Minas Gerais), Victor H. C. Melo (Universidade Federal de Minas Gerais), and William Robson Schwartz (Universidade Federal de Minas Gerais)</i>	
Simultaneous Iris and Periocular Region Detection Using Coarse Annotations .....	178
<i>Diego R. Lucio (Federal University of Paraná), Rayson Laroca (Federal University of Paraná), Luiz A. Zanlorensi (Federal University of Paraná), Gladston Moreira (Federal University of Ouro Preto), and David Menotti (Federal University of Paraná)</i>	
Video Audience Analysis using Bayesian Networks and Face Demographics .....	186
<i>Ítalo de P. Oliveira (Federal University of Campina Grande), Carlos D. O. Interaminense (Federal University of Campina Grande), Eanes T. Pereira (Federal University of Campina Grande), and Herman M. Gomes (Federal University of Campina Grande)</i>	

## **TS8: Computer Vision**

Optimizing Super Resolution for Face Recognition .....	194
<i>Antonio Augusto Abello (University of São Paulo) and R. Hirata Jr. (University of São Paulo)</i>	

## **TS9: Computer Vision and Pattern Recognition**

How Effective Is Super-Resolution to Improve Dense Labelling of Coarse Resolution Imagery? .....	202
<i>Matheus B. Pereira (Universidade Federal de Minas Gerais) and Jefersson A. dos Santos (Universidade Federal de Minas Gerais)</i>	
Simple and Effective Load Volume Estimation in Moving Trucks using LiDARs .....	210
<i>Lucas L. Amorim (Universidade Federal do Espírito Santo), Filipe Mutz (Instituto Federal do Espírito Santo, Universidade Federal do Espírito Santo), Alberto F. De Souza (Universidade Federal do Espírito Santo), Claudine Badue (Universidade Federal do Espírito Santo), and Thiago Oliveira-Santos (Universidade Federal do Espírito Santo)</i>	
Hierarchy-of-Visual-Words: a Learning-Based Approach for Trademark Image Retrieval .....	218
<i>Vítor N. Lourenço (Universidade Federal Fluminense), Gabriela G. Silva (Universidade Federal Fluminense), and Leandro A. F. Fernandes (Universidade Federal Fluminense)</i>	
PursuitPass: A Visual Pursuit-Based User Authentication System .....	226
<i>Alex Torquato S. Carneiro (University of São Paulo), Carlos Eduardo L. Elmadjian (University of São Paulo), Candy Gonzales (University of São Paulo), Flavio L. Coutinho (University of São Paulo), and Carlos H. Morimoto (University of São Paulo)</i>	

Brain Extraction Network Trained with "Silver Standard" Data and Fine-Tuned with Manual Annotation for Improved Segmentation .....	234
<i>Roberto Souza (University of Calgary), Oeslle Lucena (King's College London), Mariana Bento (University of Calgary), Julia Garrafa (University of Campinas), Letícia Rittner (University of Campinas), Simone Appenzeller (University of Campinas), Roberto Lotufo (University of Campinas), and Richard Frayne (University of Calgary)</i>	

## **TS10: Pattern Recognition II**

Alignment of Local and Global Features from Multiple Layers of Convolutional Neural Network for Image Classification .....	241
<i>Fernando Pereira dos Santos (University of São Paulo) and Moacir Antonelli Ponti (University of São Paulo)</i>	
On Modeling Context from Objects with a Long Short-Term Memory for Indoor Scene Recognition .....	249
<i>Camila Laranjeira (Universidade Federal de Minas Gerais), Anisio Lacerda (Universidade Federal de Minas Gerais), and Erickson R. Nascimento (Universidade Federal de Minas Gerais)</i>	
A Hybrid Frequency-Domain/Image-Domain Deep Network for Magnetic Resonance Image Reconstruction ...	257
<i>Roberto Souza (University of Calgary) and Richard Frayne (University of Calgary)</i>	
Dynamic Sign Language Recognition Based on Convolutional Neural Networks and Texture Maps .....	265
<i>Edwin Escobedo (Fderal University of Ouro Preto), Lourdes Ramirez (National University of Trujillo), and Guillermo Camara (Federal University of Ouro Preto)</i>	
<b>Author Index .....</b>	<b>273</b>