

Jesús Ariel Carrasco-Ochoa
José Francisco Martínez-Trinidad
José Arturo Olvera-López
Joaquín Salas (Eds.)

LNCS 11524

Pattern Recognition

11th Mexican Conference, MCPR 2019
Querétaro, Mexico, June 26–29, 2019
Proceedings

 Springer

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board Members

David Hutchison

Lancaster University, Lancaster, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Zurich, Switzerland

John C. Mitchell

Stanford University, Stanford, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

C. Pandu Rangan

Indian Institute of Technology Madras, Chennai, India

Bernhard Steffen

TU Dortmund University, Dortmund, Germany

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Jesús Ariel Carrasco-Ochoa ·
José Francisco Martínez-Trinidad ·
José Arturo Olvera-López ·
Joaquín Salas (Eds.)

Pattern Recognition

11th Mexican Conference, MCPR 2019
Querétaro, Mexico, June 26–29, 2019
Proceedings

 Springer

Editors

Jesús Ariel Carrasco-Ochoa
National Institute of Astrophysics,
Optics and Electronics
Puebla, Mexico

José Arturo Olvera-López
Autonomous University of Puebla
Puebla, Mexico

José Francisco Martínez-Trinidad
National Institute of Astrophysics,
Optics and Electronics
Puebla, Mexico

Joaquín Salas
National Polytechnic Institute of Mexico
Querétaro, Mexico

ISSN 0302-9743

ISSN 1611-3349 (electronic)

Lecture Notes in Computer Science

ISBN 978-3-030-21076-2

ISBN 978-3-030-21077-9 (eBook)

<https://doi.org/10.1007/978-3-030-21077-9>

LNCS Sublibrary: SL6 – Image Processing, Computer Vision, Pattern Recognition, and Graphics

© Springer Nature Switzerland AG 2019






This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Facial Re-identification on Non-overlapping Cameras and in Uncontrolled Environments

Everardo Santiago Ramírez¹(✉) , J. C. Acosta-Guadarrama¹ ,
Jose Manuel Mejía Muñoz¹ , Josue Dominguez Guerrero¹ ,
and J. A. Gonzalez-Fraga² 

¹ Instituto de Ingeniería y Tecnología, Universidad Autónoma de Ciudad Juárez,
Ciudad Juárez, Mexico

{everardo.santiago,juan.acosta,jose.mejia,josue.dominguez}@uacj.mx

² Facultad de Ciencias, Universidad Autónoma de Baja California,
Ensenada, Mexico

angel.fraga@uabc.edu.mx

Abstract. Face re-identification is an essential task in automatic video surveillance where the identity of the person is known previously. It aims to verify if other cameras have observed a specific face detected by a camera. However, this is a challenging task because of the reduced resolution, and changes in lighting and background available in surveillance video sequences. Furthermore, the face to get re-identified suffers changes in appearance due to expression, pose, and scale. Algorithms need robust descriptors to perform re-identification under these challenging conditions. Among various types of approaches available, correlation filters have properties that can be exploited to achieve a successful re-identification. Our proposal makes use of this approach to exploit both the shape and content of more representative facial images captured by a camera in a field of view. The resulting correlation filters can characterize the face of a person in a field of view; they are good at discriminating faces of different people, tolerant to variable illumination and slight variations in the rotation (in/out of plane) and scale. Further, they allow identifying a person from the first time that has appeared in the camera network. Matching the correlation filters generated in the field of views allows establishing a correspondence between the faces of the same person viewed by different cameras. These results show that facial re-identification under real-world surveillance conditions and biometric context can be successfully performed using correlation filters adequately designed.

Keywords: Face re-identification and recognition · Biometrics · Correlation filters