

# QUIS-CAMPI: Human Recognition in Surveillance Scenarios

## Overview

Recent attacks in crowded urban environments reduced the perception of safety in modern societies that citizens have, particularly during sports, political or social events (due to e.g., 2001 New York 9/11, 2004 Madrid train bombing, 2013 Boston marathon attacks, and Bombay, India 26/11, 2009). Currently, there is a growing need of assure the safety of people, especially in places/events that concentrate large crowds, which are naturally perceived as those with the highest risk. It is very difficult for authorities to confirm whether dangerous individuals are among a crowd, which augments the fear of citizens. In order to counterbalance this fear, visual surveillance systems are deployed in most of the cities. However, there are no automatic schemes available to identify subjects without their participation during data acquisition process. Even though national / international authorities have lists of potentially harmful individuals; it is particularly difficult for humans to confirm whether such elements are among a crowd. As an example, the TIDE: Terrorist Identities Datamart Environment from the U.S. National Counterterrorism Center has over 745,000 people listed in the database which authorities are willing to arrest, but only a small proportion of these was actually detected in visual surveillance systems. Simultaneously, biometrics is considered as an especially successful case in the domain of pattern recognition, but performance is still strongly conditioned by the levels of cooperation demanded to subjects and by the environmental conditions required to obtain data with minimal levels of quality.

The acronym of the course (QUIS-CAMPI) is a composition of two Latin terms and summarizes its goals: “Quis” stands for “who is” and “Campi” refers to “delimited spaces” (plural of “Campus”). Hence, this course is a thorough exploration for engineers and scientists in order to design a system for automatically recognize human beings in urban crowded environments and totally non-cooperative settings (i.e., covertly). It surveys both the low-level vision problems (background estimation methods, human detection schemes, and tracking methods) and high-level vision problems (soft biometrics, periocular segmentation, fusion of iris and periocular recognizers), evolved in this challenging task, as well discusses the privacy and ethics issues that yield from the fact of having automata continuously analyzing the identity of humans in public spaces.

**The course will cover:** i) coupled visual surveillance and PTZ imaging devices; ii) use of soft biometric information for indexing / retrieval in database identities; iii) use of strong biometric traits for watch list detection; iv) innovative ways to fuse information from the face and periocular recognition modules; and v) faithfully balance of ethics / privacy vs. safety / security issues.

<b>Modules</b>	<p><b>November 6, 2017:</b> (T) Study of typical visual surveillance system and background subtraction methods; (P) Hands-on background subtraction methods.</p> <p><b>November 7, 2017:</b> (T) Study of different approaches for human detection schemes and pose-estimation algorithms; (P) Hands-on human detection and pose estimation algorithms.</p> <p><b>November 8, 2017:</b> (T) Study of tracking methods and biometric data in surveillance scenarios; (P) Hands-on head detection schemes.</p> <p><b>November 9, 2017:</b> (T) Study of Soft-biometrics and periocular segmentation; (P) Hands-on ocular data segmentation.</p> <p><b>November 10, 2017:</b> (T) Fusion of Iris and Periocular recognizers and ethics/privacy vs. safety/security; (P) Hands-on biometric recognition.</p> <p style="text-align: center;"><b>Course Exam will be conducted on November 11, 2017</b>  <i>Number of participants for the course will be limited to fifty.</i>  <i>All modules are compulsory to attend</i></p>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>▪ You are an executive, engineer and researcher from industry and government organizations, including R&amp;D laboratories interested in learning/working signal processing.</li> <li>▪ You are a student at all levels (B.Tech/M.Sc/M.Tech/Ph.D) or Faculty from the reputed academic institutions interested in pursuing research in Signal/Image/Video Processing and Biometrics.</li> </ul>
<b>Fees</b>	<p>The participation fees for taking the course is as follows:  <b>Participants from abroad : US \$300</b>  <b>Industry/ Research Organizations: Rs. 5000/-</b>  <b>Academic Institutions: Rs. 4000/- (Faculty) &amp; Rs. 1,000/-(Student)</b>  <b>(For SC/ST students 50% fee is waived)</b></p> <p>The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage and Internet facility.</p>

## The Faculty



**Prof. Hugo P. Proença** received the B.Sc. in Mathematics/Computer Science from University of Beira Interior and M.Sc. degrees in Artificial Intelligence from University of Oporto, Portugal in 2001 and 2004, respectively, and the Ph.D. degree in Informatics Engineering from the University of Beira Interior, Covilhã, Portugal, in 2007. His doctoral research focused on Towards Non-cooperative Biometric Iris Recognition. After graduating, he worked as a Assistant Professor up to 2015 in the University of Beira Interior, Covilhã, Portugal, where he became Associate Professor of Computer Vision in May 2015. He currently holds the position of Head of the Department of Computer Science, University of Beira Interior, Covilhã, Portugal. His main research interests are Non-cooperative biometric recognition, biometric in visual surveillance and forensics.

Prof. Hugo P. Proença is IEEE Senior member and the coordinating editor of IEEE Biometric Council Newsletter, Area editor of the IEEE Biometric Compendium, Associate Editor of Editorial board of the Image and vision Computing Journal and Member of the International Journal of Biometrics.



**Dr. Amol D. Rahulkar** is working as an Assistant Professor in the Department of Electrical and Electronics Engineering, National Institute of Technology Goa, India. His research interests include Biometrics, Design and Application of Wavelet filter-banks, and FPGA implementation of architecture for multimedia systems.



**Dr. Badri Narayan Subudhi** is an Assistant Professor in the department of Electronics and Communication Engineering, at National Institute of Technology Goa since July 2014. His research interests include Image and Video Analysis, Medical Image Analysis, Pattern Recognition, and Remotely Sensed Image Analysis.

## Location:



National Institute of Technology Goa  
Farmagudi, Ponda, Goa-403401, India

## Course Duration:

One Week: November 6-11, 2017

## Course Coordinators

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Course Registration Link:

<http://www.gian.iitgoa.ac.in/GREGN>