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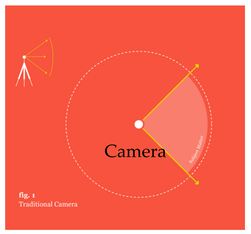
Human detection on omnidirectional camera imagery by multi-feature fusion based on gradients, color and local phase information

Hussin Ragb, and Vijayan Asari

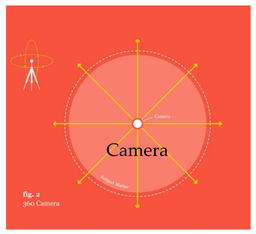
Introduction

In this research work, we present a multi-feature algorithm that employs only one omnidirectional camera instead of using multiple traditional cameras to cover the entire surveillance region.



Traditional Camera

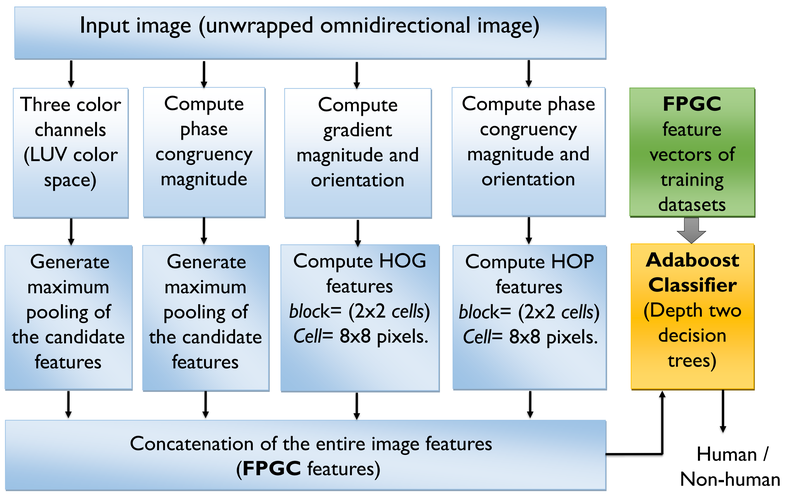
Omnidirectional Camera



Omnidirectional Camera

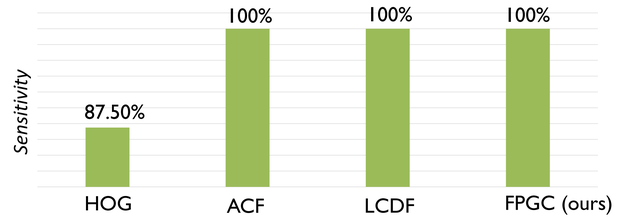
In this algorithm, we use image gradients, local phase information based on phase congruency, phase congruency magnitude, and the color features. These features are fused together to build one descriptor named as "Fused Phase, Gradients and Color features (FPGC).

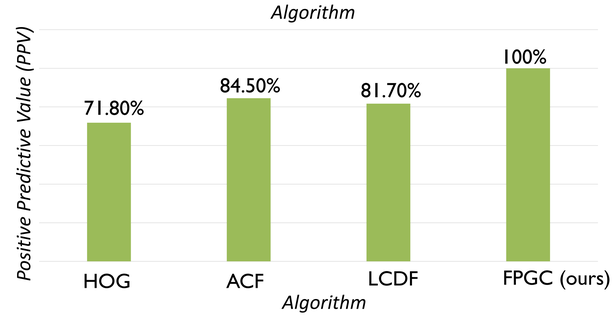
Human Detection Framework

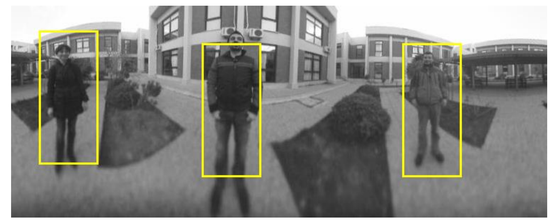


Experimental Results

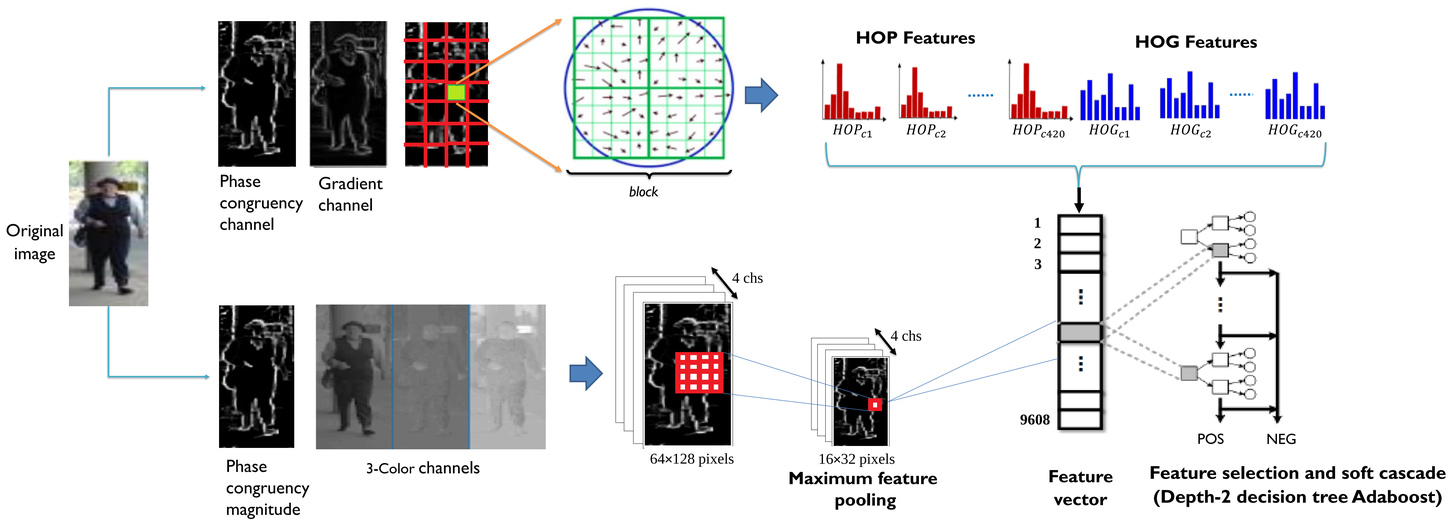
- **INRIA dataset** is used for training: 2000 humans; 10k non-human
- **Yalin Bastanlar dataset** used for testing.
  - ✓ contains 30 panoramic omnidirectional images
  - ✓ 66 (standing) humans
- Sensitivity and Positive Predictive Value (PPV) of the human detection based on FPGC descriptor and it is comparison with the HOG, ACF, and LDCF algorithms.







Human Detection System Based on FPGC Descriptor



UNIVERSITY of DAYTON

Vision Lab
Kettering Laboratories
300 College Park
Dayton, OH 45469-0232

Center of Excellence for Computer Vision and Wide Area Surveillance Research
visionlab.udayton.edu

Dr. Vijayan K. Asari
Director
(937) 229-4504
vasari1@udayton.edu