MIF23 : Analyse d'image : TP
Mars 2017

Object: Implement method for and body parts identification and action interpretation.

TP: Propose

The primary purpose of this TP is to perform the 2 steps of task:

1. Foreground object extraction (students can refer / use OpenCV).

2. Representative body parts (head, torso and legs) identification. To do this task foreground object extraction is required.

3. Posture (or Body Language) Interpretation

Preliminary:

Perform basic image operations: read and generate an image (different formats: color) and visualize it (students can refer / use OpenCV)
2 . To perform this TP, following preprocessing steps (already covered during the lectures and OpenCV Library) can be useful:

a. noise removal / filtering
b. image averaging / smoothing / low pass filtering (space smoothing)
c. image averaging / smoothing (temporal smoothing)

It is suggested to adapt some tools for preprocessing step(s) : filtering, convolution with a smoothing mask, mixture of Gaussian or other operators that are included in OpenCV.

Pointers to main tasks:

1. To understand the task of foreground object extraction and know state of the art, it is could be beneficial to read these two papers:

a. Survey1: http://users.utcluj.ro/~tmarita/HCI/C5-extra/BackgroundSubtractionReview-Piccardi.pdf
b. Survey2 : https://www.researchgate.net/publication/262077612_Traditional_and_Recent_Approaches_in_Background_Modeling_for_Foreground_Detection_An_Overview
c. install the OpenCv software and Get started with it : try it with some images and video.
Please, start by testing it through a series of images and videos

2. Methods for identifying specific body parts fall into two broad categories: model based and learning methods. Student can choose methods of their choice (few approaches will be covered during the lectures and literature).
   a. Two topics have been proposed, feel free to choose the one that will best suit your interest.

- Principal full-body parts identification in video and "detect some falls and distress situations"
- Some body parts identification and action recognition

TP deliverables:

Following deliverables are expected:

1. Students are expected to submit source code for the implemented algorithm. The source code should be complete and commented well. Submission should include all required tools and all other dependent files necessary for compilation (compilation guidelines should also be provided).
2. Report for the TP, which should address the following aspects:
    a. Presentation of implemented algorithms with respect to other existing algorithm (analysis).
    b. Specific achievements i.e. novelty of proposition (if any).
    c. Results on different images, result at different steps (if possible)
    d. Report should be well structured and complete.
3. A demonstration of the software/algorithm will be made in the presence of supervisor. The presence of all team members is mandatory (15 minutes to 20 minutes for the demo). The absence from the demo session will be considered as an absence from an exam.

Note:

1. Algorithm can be implemented -preferably- in C
   GPU implementation will be accepted (but not required).

2. You are strongly encouraged to write the report in English.
3. Feel free to ask questions or discuss your ideas during TP sessions. Supervisor can also be reached through email (address given below) out of TP sessions:
   Saida Bouakaz : saida.bouakaz@univ-lyon1.fr