FAST (Fast And Simple Tracker): a documentation

Installation

Installation in Linux

The simplest way to use FAST on Linux is to compile it from sources:

- Download or clone the code from GitHub: https://github.com/tomcombriat/FAST
- Install the dependencies: OpenCV 3.0 devellopments packages[1] , CMake and ffmpeg.
- In the "FAST" folder execute:

```
cmake .
make
```

You can now execute FAST running:

```
./FAST input_video output_text_file -karg
```

Where `input_video` is the path to the video you want to analyse, `output_text_file` will be the path to the file where the tracks will be stored, and `-karg` can be `-test` if you want to execute the program in test mode.

Installation in Windows

You can download a compiled version of FAST for Windows (64 bits) on Github: https://github.com/tomcombriat/FAST_

After extracting the archive, you can execute FAST just clicking on FAST.exe. Unlike its Linux counterpart, the Windows version of FAST will ask you for the input and output files on start.

Use

Detection

FAST uses a LOG[2] (Laplacian of Gaussian) filter to find particles. This filter need a few arguments:

- the `blur size` for Gaussian blur, this number should be positive and odd. If t is your blur size, the filter will be more sensible to blobs of size $\sqrt{2t}$.
- the `Laplacian kernel`: define the kernel used to compute the Laplacian[3]. By default you can put this value to 3.
- the `search radius` will be the maximum distance where the tracker will look from a particle position on frame N to find its match on frame $N+1$.

[1] as an example, on Debian these are the packages `libopencv-core-dev`
[2] https://en.wikipedia.org/wiki/Blob_detection#The_Laplacian_of_Gaussian
[3] https://en.wikipedia.org/wiki/Discrete_Laplace_operator

Linking

Linking particles will be done automatically using the nearest neightbor algorithm. Furtther developments include implementation of predictive algorithms.