Towards Mobile HDR Video
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Introduction
We present a method for High Dynamic Range Video where the critical phases of the pipeline are based on histograms. It was briefly introduced in [VELHO]

- It is possible to achieve high framerates, since the algorithm generates one HDR frame per captured frame
- The method is of low computational cost, making it particularly suited for devices with less powerful processors

Capture
- We used a Nokia N900 running a Maemo 5 distribution. It has a 5MP programmable camera
- Exposure bracketing and autoexposure are performed during the whole capture
- The application was developed using the FCAM API [ADAMS]

Exposure Fusion for Video
- Another interesting approach to produce high quality videos is Exposure Fusion [MERTENS]. It is faster and simpler than traditional HDR, and although it does not really extend the dynamic range of a picture, the results are very promising
- It consist basically on a weighted average of the different-exposed frames, considering their well-exposedness, saturation and detail
- Its extension to video is straightforward, and some other parameters related to movement can be used to avoid ghosting

Results
HDR approach
- Exposure bracketing and autoexposure are performed during the whole capture

Exposure Fusion approach
- For each three consecutive frames, we reconstruct three intermediate HDR images considering their immediate neighbors
- Considering the same pixel position across frames and fixing a reference frame F, these computed radiance values can be combined according to their variances. If the variance is high, some movement must have happened, and the reference pixel receives greater weight. Each frame is processed as reference, and then we average three consecutive results

Radiance Map Reconstruction