Software Architecture Specification

Definitions

- Macro block (MB) - Block of 16x16 pixels
- Motion Vector (MV) - Motion Vector (result of Motion Estimation (ME))
- Search range - Block of 96x128 pixels
- Motion Vector Predictor (MVP) - location from which to start motion estimation
- F[n] - Frame with index n in the original stream (n=1...N)
- D[n] - Decoded F[n] frame

Proposed solution

The proposed solution is based on hierarchical motion estimation using preENC with data processing in a single thread. But probably it will be reworked in the future to enhance the performance using multi-threads.

Common schema

- Allocate memory to store all frames needed to decode one
- Read frames from the input YUV file one by one using YUV reader from the sample library
- Decode F[n] frame basing on data from the reference one (F[n-1]):

  D[n] = Decode(F[n-1], F[n]), n = 2..N
- Save D[n] to the result stream using YUV writer from the sample library

Decode() function

1. Resize F[n-1] and F[n] frames to reduce their size in 4 times. Results frames are R[n-1] and R[n] correspondingly
2. Get set of search ranges so it should cover whole R[n-1]
3. Do motion estimation for each MB in R[n] using preENC (each MB corresponds to one reduced tile). MVPs are selected consequently according to set of search ranges. Results are coarse MVs for each MB
4. Estimate, rescale and round course MVs. Results are precise MVs
5. Move tiles to the resulted frame using VPP and resulted MVs
6. Crop the result frame according to the original size