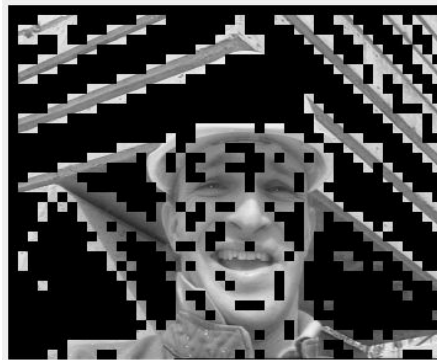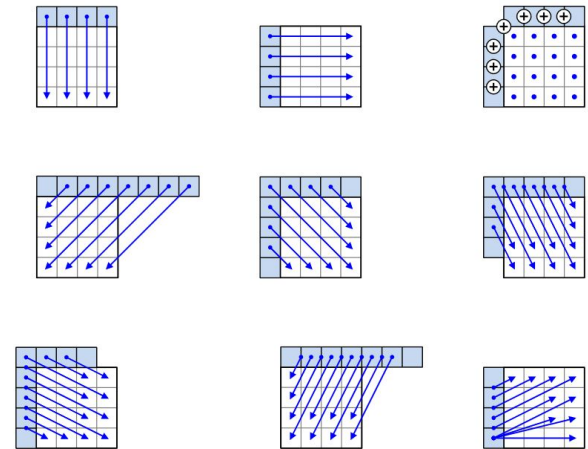# Type of optimization & Details of implementation

Intra Mode

- Using **4x4** and **8x8** Spatial Prediction
- Y and CbCr
- Choice defined by 8x8 Block Entropy to Mean Picture Entropy comparison
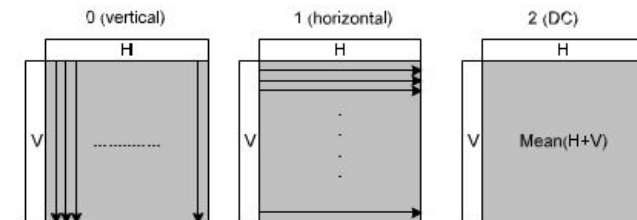- Example for possible Encoding scheme

- Problem: Quantization introduces error
  → 4x4 prediction is especially vulnerable, error propagates through image
  Solution: Integer DCT (sadly no time left :( )

4x4 AVC Spatial Intra Prediction

8x8 AVC Spatial Intra Prediction

Source: 4x4 Pred. fig T. Wiegand (TU Berlin) — Image and Video Coding: Advanced Intra Coding
8x8 Pred:
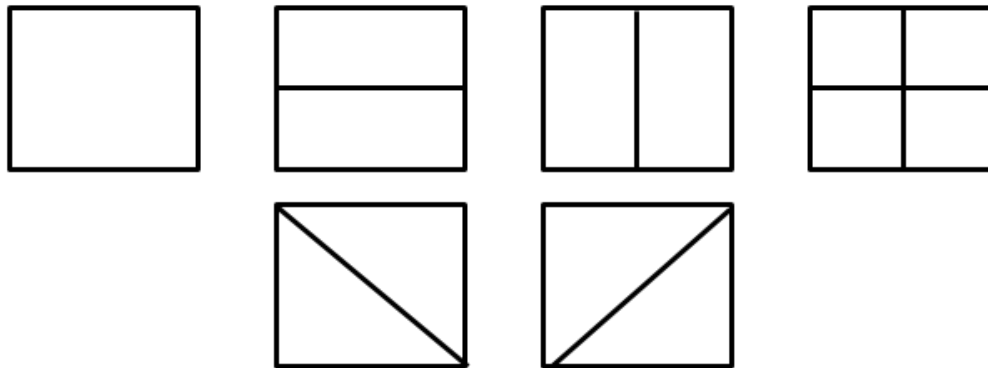https://www.vcodex.com/h264avc-intra-precition/

Details of implementation

Inter Mode

- Two Dimensional Logarithmic Search, supports: **square**, **rectangle** and **triangle**
- 6 Different Motion Compensation Modes

6 Motion Compensation Modes

- Best Matching Block (least error) calculated & transmitted
- DC Prediction in Trafo Domain

RD Curves

BPP to PSNR Plot for qScales [0.07, 0.2, 0.4, 0.8, 1.0, 1.5, 2, 3, 4.1, 4.5]

Legend:
- Image Codec Chap 4
- Video Codec Chap 5
- Image Codec Opt. only 8x8
- Video Codec Opt. only 8x8
- Image Codec Opt. h_fac = 1.05
- Video Codec Opt. h_fac = 1.05

Axes: PSNR [dB] vs BPP [bit/pixel]