**Research background**

HEVC intra prediction

1. In H.264, there are only 9 prediction modes, but HEVC increased to 34 modes.
2. In H.264, intra unit partitioning only 16x16 and 4x4, but HEVC increased to multiples sizes from 4x4 to 64x64.

**Target**

Fast and efficient intra prediction algorithm is necessary

**Proposed method**

1. Pixel Gradient Statistics (PGS) and Mode Refinement (MR) based fast mode decision
2. Partitioning reconfiguration based fast depth decision

**Overview flowchart**

- **Start**
  - **uiDepth=1 & 3**
  - **uiDepth=3**
  - **Rough mode decision**
  - **Threshold A & B**
  - **uiDepth=1 & 3**
  - **Mode Refinement**

- **Prediction mode remains less than 2**
  - **Yes**
    - **RDO mode decision**
    - **RDO transform decision**
    - ** ubestPUMode**
    - **uiDepth=3 & PU=NxN**
  - **No**
    - **AngMode**
    - **RDO mode decision**
    - **RDO transform decision**
    - ** ubestPUMode**
    - **uiDepth=0 & 2**

**Conclusion**

With the proposed algorithm, approximately 42.84% time saving can be achieved. BD–Rate increase is only 0.61% and BD–PSNR loss only 0.041db. This result is better than previous work both in time-saving and performance loss.