Intra-Picture Prediction in HEVC

Abstract

基本步骤

```
reference sample array construction
sample prediction
post-processing
```

要求

```
computational requirements in both the encoder and decoder
```

mode--scenario

```
angular prediction--objects with directional structures
planar prediction and DC prediction modes--smooth image areas
```

1 Introduction

分类:

```
angular prediction(2-34)--objects with directional structures
planar prediction(0) and DC prediction(1) modes--smooth image areas
总mode:35
```

资源:

```
reference samples from the adjacent reconstructed blocks
transform block size
```

提升性能

```
different filtering alternatives for pre-processing the reference samples
post-processing step to refine the sample surface continuity on the block bound
```

2 Reference Sample Generation

intra实现方式

```
外推样本值
```

相比于264的区别:

```
introduces a reference sample substitution process
-use the complete set of intra prediction modes regardless of the availability
reference samples, 264只允许DC prediction

adaptive filtering process that can pre-filter the reference samples
   to increase the diversity of the available predictors
   according to
       intra prediction mode
       block size
       directionality
```

2.1 Reference Sample Substitution

作用:

```
产生更多有用的数据
```

某些reference samples不能用于预测的原因:

```
samples outside of the picture
slice or tile are considered unavailable for prediction
```

特殊情况:

```
所有reference sample都不可用--substituted by a nominal average sample value for
至少一个可用:in clock-wise direction填充

    过程:
    纵向最下方如不可用, 被顺时针的第一个可用值替代
    纵向每个不可用值被下方值替代
    横向每个不可用值被左方的值替代
```

2.2 Filtering Process of Reference Samples

3 Intra Sample Prediction

3.1 Angular Prediction

3.1.1 Angle Definitions

3.1.2 Reference Row Extension for the Negative Prediction Directions

3.1.3 Sample Prediction for Angular Prediction Modes

3.2 DC Prediction

3.3 Planar Prediction

3.4 Post-processing for Predicted Samples

4 Intra Mode Coding

4.1 Prediction of Luma Intra Mode

4.2 Derived Mode for Chroma Intra Prediction

4.3 Syntax Design for Intra Mode Coding

5 Encoding Algorithms

6 Coding Efficiency and Decoder Complexity

6.1 Coding Efficiency

6.2 Decoder Complexity

7 Main Still Picture Profile and Its Applications

8 Summary of Differences from H.264/AVC