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AHG 4
Post Processing in interlace coding mode for MVC+D

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- Current post processing tools in ATM
- Issues with current post processing tool
- ITRI's solutions for post processing tool in interlace coding mode
- Issues with options for post dilation filter
- Issue with inconsistent simulation results in different platform
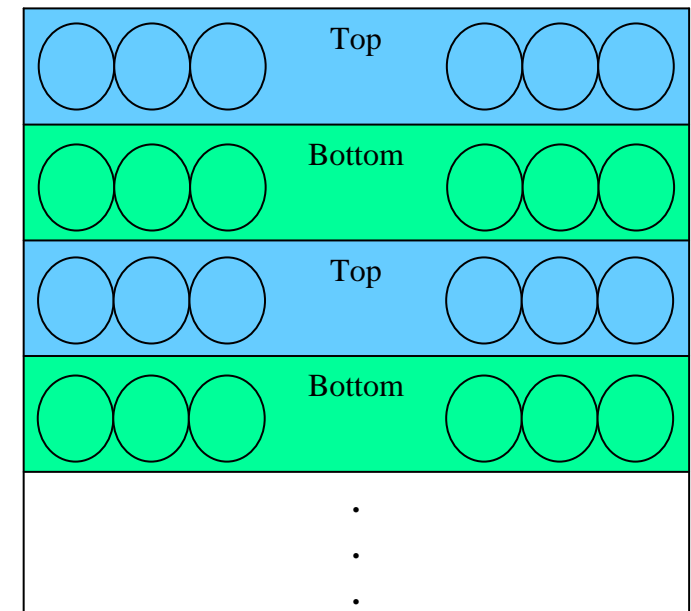
Current Post Processing tools

- ## Interlace integration with ATM were focused on mandatory coding tools at last meeting.

- ## Two optional Post Processing tools in ATM:

  - ### Up-sampling

  - ### Post dilation filter

- ## One example:Post Process for depth coding

Decoded depth → **Post Process** → Output depth

Issues with current Post Processing tools in interlace coding mode

- In interlace coding mode, the decoded top and bottom fields are interlaced in a decoded picture.

- The Post Processing tools use vertical neighbor pixels for filtering.

  - Using adjacent pixels from different fields leads to design inconsistency.
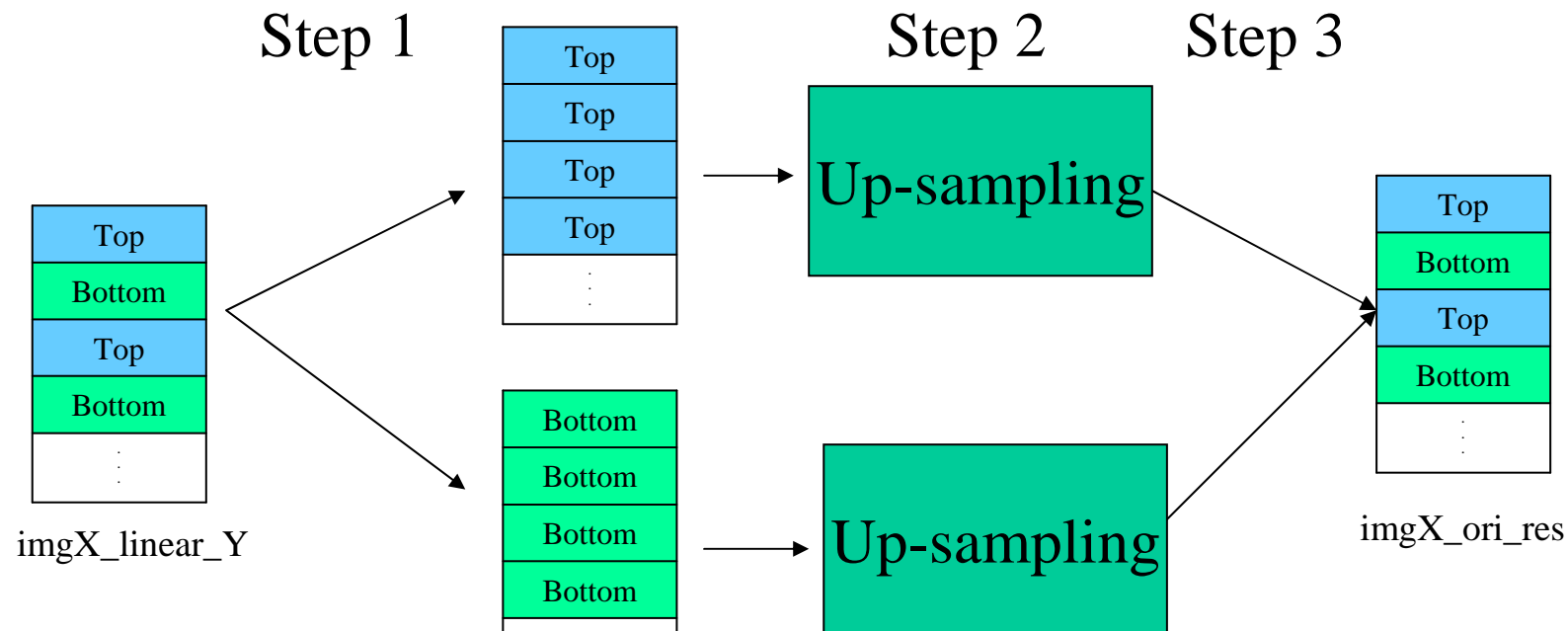
Decoded picture [4]

Issue with current up-sampling tool in interlace coding mode

- Before writing out the YUV picture, up-sampler uses vertical adjacent pixels to convert the decoded picture from coding resolution to original resolution
  - Example: 512*384 →1024*768
- In interlace coding mode, the decoded picture contains the interlaced top and bottom fields
  - Top and bottom fields are not separated.

ITRI's solution for up-sampling tool in interlace coding mode

- ## Three steps for modification:
  - Step 1:Extract top and bottom field from a frame
  - Step 2:Perform up-sampling
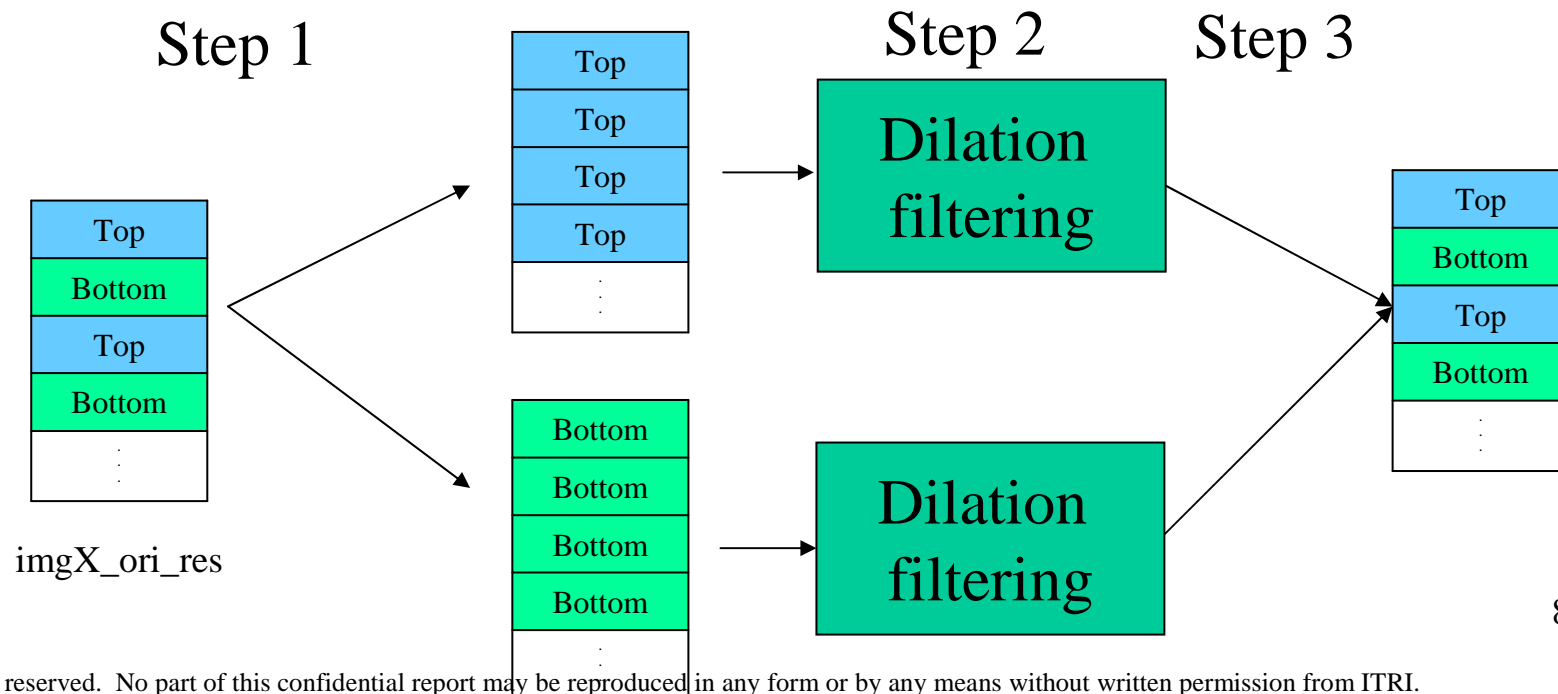 - Step 3:Generate a frame from top and bottom fields

Step 1

Step 2   Step 3

imgX_linear_Y

imgX_ori_res

- Post Dilation filter uses vertical pixels for filtering.
  - For interlace coding, the Post Dilation filter is directly applied to the interlaced picture.
  - Top and bottom picture should be filtered separately.

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ITRI's solution for Post Dilation filter in interlace coding mode

- ## Three steps for modification:
  - Step 1:Extract top and bottom field from a frame
  - Step 2:Perform post dilation filtering
  - Step 3:Generate a frame from top and bottom fields

- ## One example:

Step 1

Step 2   Step 3

| Top |
| Bottom |
| Top |
| Bottom |
| ⋮ |

imgX_ori_res

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Issues with options
for post dilation filter

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- Post dilation filter is automatically applied in current ATM.

- Post dilation filter is not in normative part of the specification text
  - Should be off for conformance testing

- ATM needs an option to turn on/off the Post Dilation filter.
  - "PostDilation" option is provided in encoder/decoder configuration files

Issue with inconsistent simulation results in different platform

- Cross Platform issues with class A sequences in interlace coding mode

  - Caused by incorrect DPB frames assignment

- Correct the depth PSNR values in interlace coding mode when the NDR tool is ON

- The proposed post processing tool can use appropriate neighboring pixels in interlace coding mode for MVC+D.

  - No impacts on coding results in 3D-AVC and MVC+D progressive coding mode

- Add an option to enable/disable the post dilation filter.

- Provide a solution to resolve the cross platform issue on Class A sequences in interlace coding mode.

- Recommend to adopt the following:

    - Modification of the procedure to apply the post processing tool to the decoded depth in interlace coding mode

    - Adding the "PostDilation" option in the configuration files

    - Modification of the DPB frames assignment and depth PSNR calculation in interlace coding mode

- # Acknowledgment
  - Thanks National Cheng Kung University for cross check

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Thank You !

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