

# AVHD-AS / P.NATS Phase 2

## Processing Chain

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David Lindero (Ericsson)

Werner Robitza (AVEQ GmbH / TU Ilmenau)

**Code Contributors:**

Silvio Borer (Rohde & Schwarz), Shahid Satti (OPTICOM), Steve Göring (TU Ilmenau),  
Martin Müller (Fraunhofer ITS), Rakesh Rao (TU Ilmenau)

# AVHD-AS / P.NATS Phase 2 Project

- Joint project between VQEG and ITU-T Study Group 12, Question 14
- Evaluation of different model types:
  - Metadata-based
  - Bitstream-based
  - Pixel-based
  - Hybrid
- Scope:
  - H.264/AVC, H.265/HEVC and VP9.
  - Up to 2160p, 60 fps, 10 bit yuv422.
- Processing via FFmpeg-based processing chain developed specifically for the competition → now released open-source



# Processing Chain

- Purpose: Generate inputs for ...
  - Video quality model evaluation
  - Subjective testing
- Different types of data generated:
  - Metadata (codec, resolution, ..., for metadata-based models)
  - Frame information (size, type, for Mode 1 models)
  - Video bitstreams (for bitstream-based Mode 3 models)
  - Raw source and encoded videos (for pixel-based models)
  - (Visually) losslessly encoded videos (for subjective testing)
- Generation of short (8–10 s) or long (1–5 min) tests is possible
  - Long tests can simulate HTTP Adaptive Streaming type adaptation
  - Long tests can also have freezing/stalling added with a number of overlays, using <http://github.com/slhck/bufferer> software

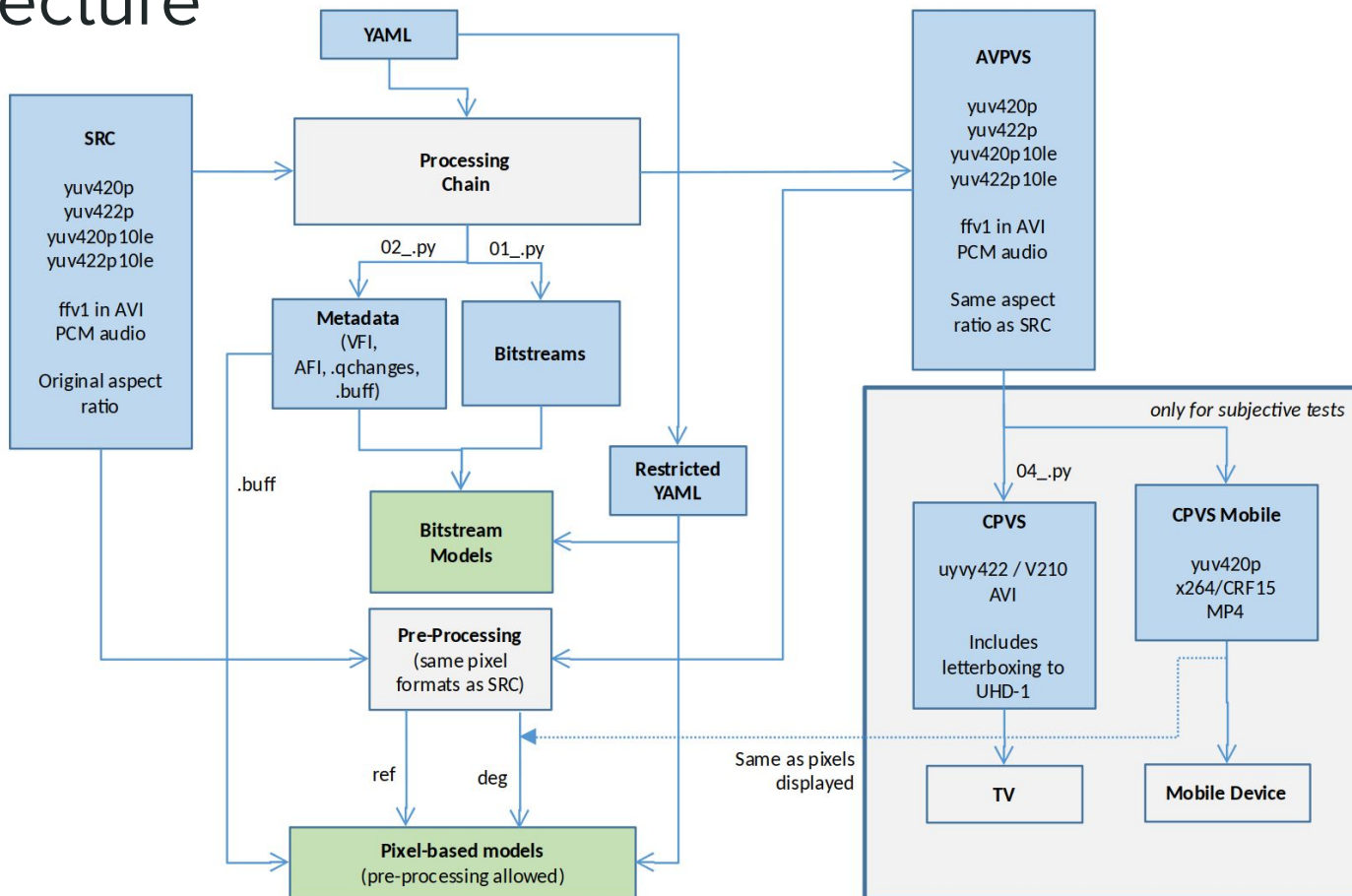
# Open Source Software Release

<https://github.com/pnats2avhd/processing-chain>

- Licensed under GNU General Public License v3, so it's free to use and modify
- Contains third-party libraries for encoding (e.g. libx264, libx265, libvpx)
- Docker-ready for portability



# Architecture



# Individual Scripts

- `p01_generateSegments.py`
  - Generate the segment(s) for each PVS in the test config.
  - This performs the actual bitstream encoding.
- `p02_generateMetadata.py`
  - Generate all the metadata files, e.g. VFI (video frame information), `.qchanges` (Mode 0 metadata), `.buff` (position/length of stalling)
- `p03_generateAvPvs.py`
  - Generate the PVS that will be input to FR models, i.e. by upscaling and decoding the segments into raw video and by (optionally, for long tests) concatenating them
- `p04_generateCpvs.py`
  - Generate the PVS that will be shown to the subjects, depending on the output context (PC, mobile, tablet)

# Test Configuration and Example Databases

- Tests are configured via YAML file
- Specification of:
  - Encoding settings / video and audio representations
  - Composition of different representations
- Example databases are available for testing
  - <https://github.com/pnats2avhd/example-databases>
  - Can be adapted for new tests

```
21  qualityLevelList:
22      Q0:
23          index      : 0
24          videoCodec : h264
25          videoBitrate : 200/250
26          width      : 192
27          height     : 108
28          fps        : original
29
30      Q1:
31          index      : 1
32          videoCodec : h265
33          videoBitrate : 100/150
34          width      : 192
35          height     : 108
36          fps        : original
37
```

# “Frozen” vs. Updated Version

- Main branch uses “old” libraries
  - Those were used at the time of processing PNATS2AVHD subjective tests
  - Branch is kept for reproducibility
- A new branch is available using most recent third-party libraries
  - <https://github.com/pnats2avhd/processing-chain/tree/updates>

**→ We hope you’ll find the tool useful!**



Thanks!

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