MSU Video-Codecs Comparison 2020: encoding presets requirements

Details about codecs requirements, comparison rules and methodology can be found on call-for-codecs page http://compression.ru/video/codec_comparison/hevc_2020/call_for_codecs.html
While choosing encoding presets for the comparison, **please focus only on the reference encoder speed** (speed limits on call-for-codecs page are presented for our system configuration and may be different for your hardware). Constant-quality mode (CRF, QP) is preferable this year, but it is possible to participate with ABR mode.

1. Our team provides participants with 4 test videos and binary of reference encoder. This year x265 is used as a good-quality reference encoder.
   x265 (reference) binary: https://builds.x265.eu/x265-64bit-8bit-2020-04-13.exe
   Videos:
   snow_mnt https://media.xiph.org/video/derf/y4m/snow_mnt_1080p.y4m
   speed_bag https://media.xiph.org/video/derf/y4m/speed_bag_1080p.y4m
   tractor https://media.xiph.org/video/derf/y4m/tractor_1080p25.y4m
   bunny https://titan.gml-team.ru:5003/sharing/60QknCm2K password: LUHRt3dXN9dVryjR

   x265 reference presets:
   - "Real-time":
   x265-64bit-8bit-2020-04-13.exe --tune ssim --preset medium --crf %BITRATE_KBPS% %SOURCE_FILE% -o %TARGET_FILE% --input-res %WIDTH%x%HEIGHT% --fps %FPS%

   - "Offline":
   x265-64bit-8bit-2020-04-13.exe --tune ssim --pass 1 --preset veryslow --crf %BITRATE_KBPS% %SOURCE_FILE% -o %TARGET_FILE% --input-res %WIDTH%x%HEIGHT% --fps %FPS% --vbv-bufsize 35000 --vbv-maxrate 35000

   x265-64bit-8bit-2020-04-13.exe --tune ssim --pass 2 --preset veryslow --crf %BITRATE_KBPS% %SOURCE_FILE% -o %TARGET_FILE% --input-res %WIDTH%x%HEIGHT% --fps %FPS% --vbv-bufsize 35000 --vbv-maxrate 35000

   **Reference decoder**: http://hevc.info/HM-doc/group___t_app_decoder.html

2. **Participants should provide MSU with encoding presets (and determine CRF range for constant-quality mode) which ensures bitrates and encoding speed, similar to the reference**. After presets submission, we will check them in our system and tell the result. You will be able to change presets if any requirements are not met.
   a. **At least 80% bitrates coverage** (percentage of reference curve covered by target codec) **for each video** must be provided. It is better to have some extra points in the ends of the line to ensure intersection of quality scores for all encoders (if there will be a lack of intersection, we will have to make additional measurements and tune CRF).
   b. **Encoding speed must be at least 90% of the reference on average:**
      gmean(mean(test_speeds) / mean(ref_speeds) for each sequence) >= 0.9, where
      gmean — geometric mean over all sequences
      mean — arithmetic mean over all bitrates for each sequence
3. See the examples below.

Examples for good bitrate coverage results (yellow — reference encoder results, blue — tested encoder):
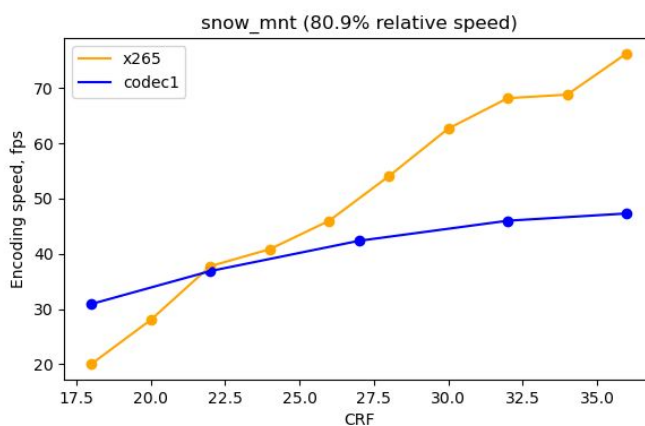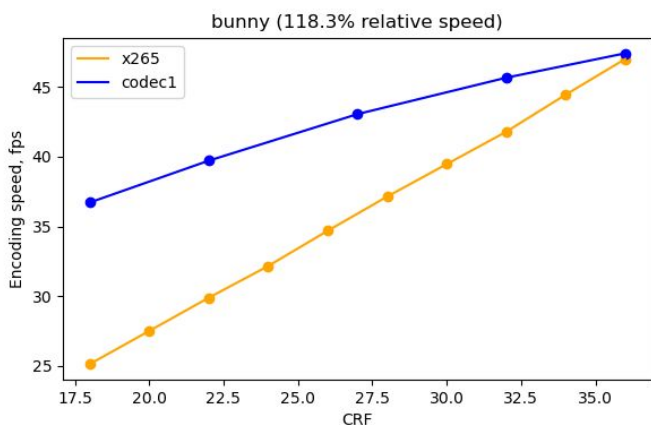

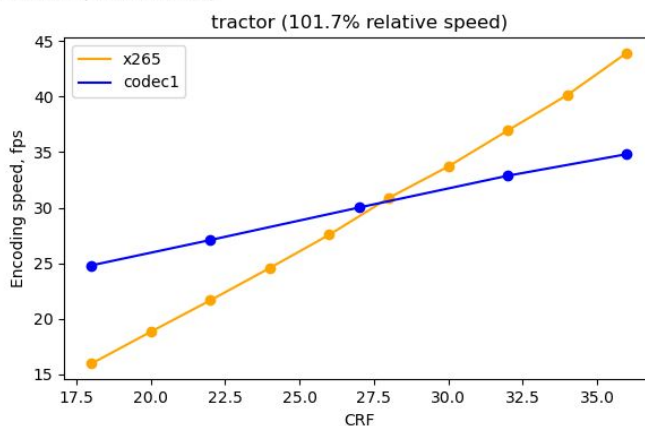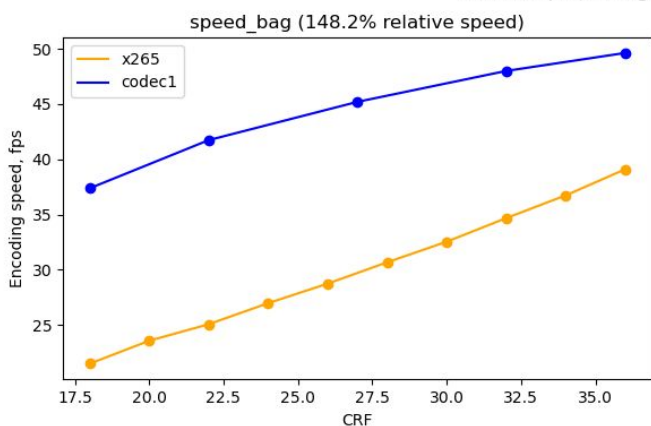Fast, 30 fps (min coverage: 92.8%)
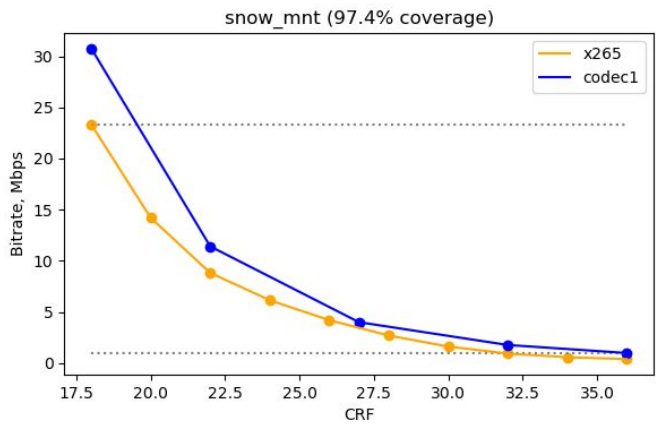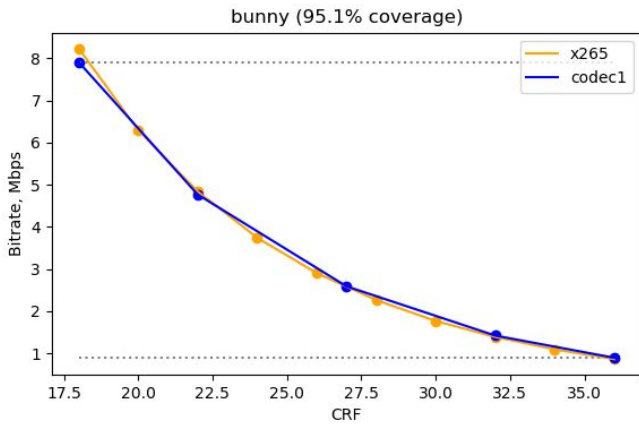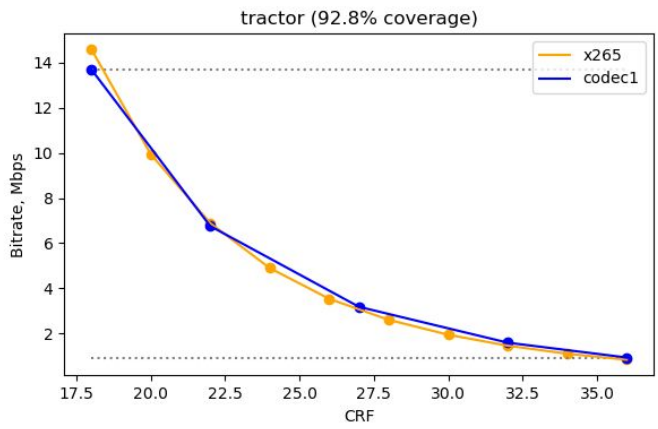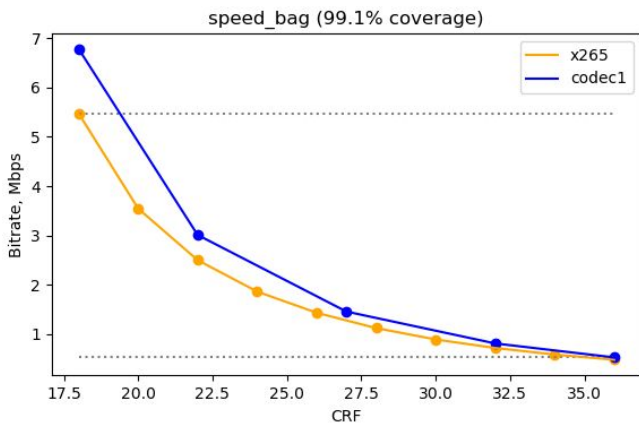
Offline, 1 fps (min coverage: 80.9%)
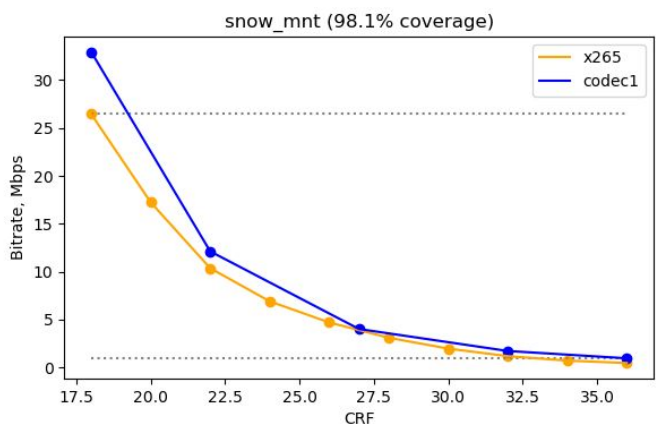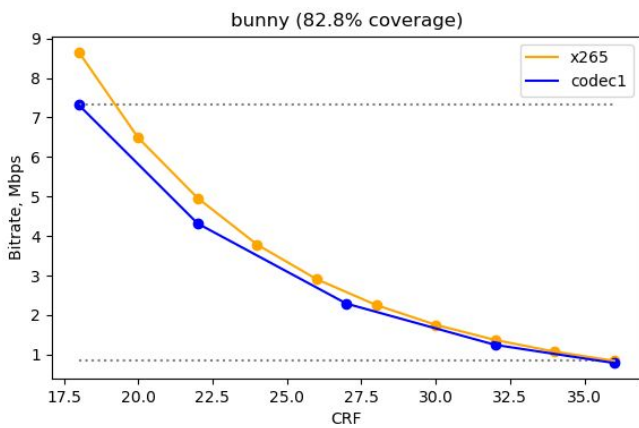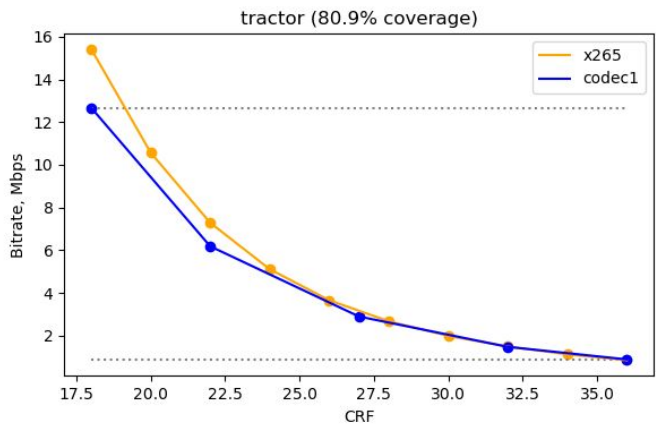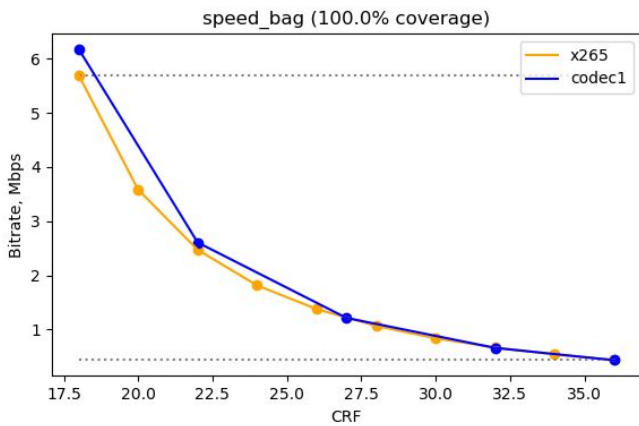
Examples for 4 good relative speed results (yellow — reference encoder results, blue — tested encoder):

Fast, 30 fps (average relative speed 109.6%)

For the following example, test codec is even too fast (3 times faster), you can choose a slower preset.

Offline, 1 fps (average relative speed 294.9%)