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# UPDATE ON OPEN OPTIMIZED VVC IMPLEMENTATIONS

## VVENC AND VVDEC

JVET-U0135

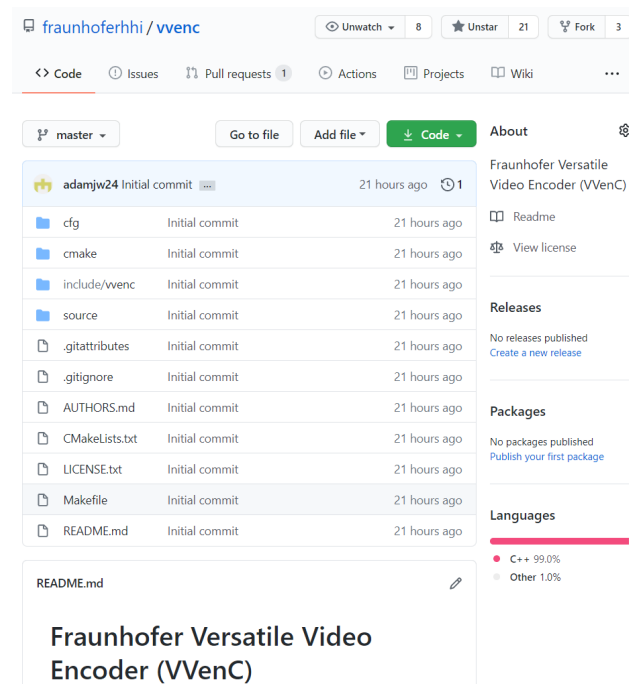
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A. Wieckowski, J. Brandenburg, C. Bartnik, V. George, J. Güther, G. Hege, C. Helmrich,  
A. Henkel, T. Hinz, C. Lehmann, C. Stoffers, I. Zupancic, B. Bross, H. Schwarz, D. Marpe

# Open optimized VVC implementations

## Available on GitHub since Sep. 2020

- Fraunhofer Versatile Video Encoder (VVenC)  
<https://github.com/fraunhoferhhi/vvenc>
- Fraunhofer Versatile Video Decoder (VVdeC)  
<https://github.com/fraunhoferhhi/vvdec>
- Free for academic and non-commercial use



# VVenC v0.2.1.0

## Main changes since Sep. 2020 (v0.1):

- **License:** SW license changed to a copyright 3-clause BSD license
- **Presets:**
  - More efficient and faster existing presets (faster, fast, medium, slow)
  - Added a new preset “slower” to achieve VTM-11 CTC coding efficiency.
- **New coding tools:**
  - Intra Sub-Partitions (ISP)
  - Transform Skip Residual Coding (TSRC)
  - Block-level Differential Pulse Code Modulation (BDPCM)
- **Rate Control (RC):** improved 1-pass RC and added new 2-pass RC.

# VVdeC v0.2.0.1

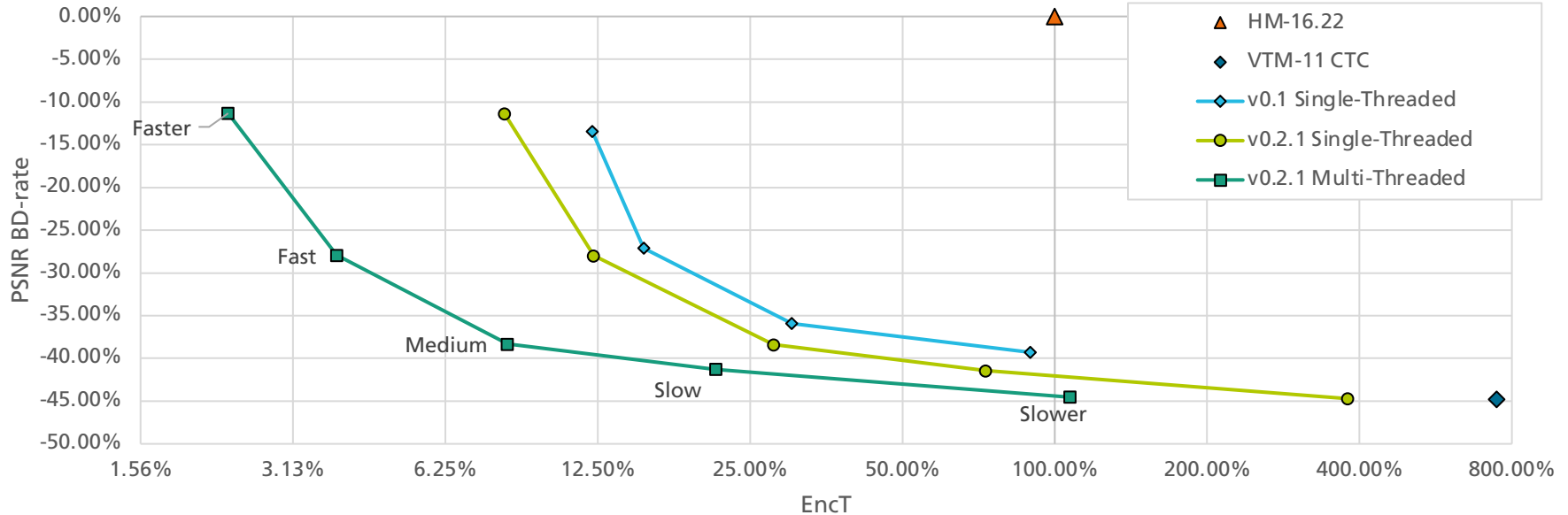
## Main changes since Sep. 2020 (v0.1):

- **License:** SW license changed to a copyright 3-clause BSD license
- **Various fixes and improvements**

# VVenC

## JVET CTC Performance – YUV PSNR for HD und UHD

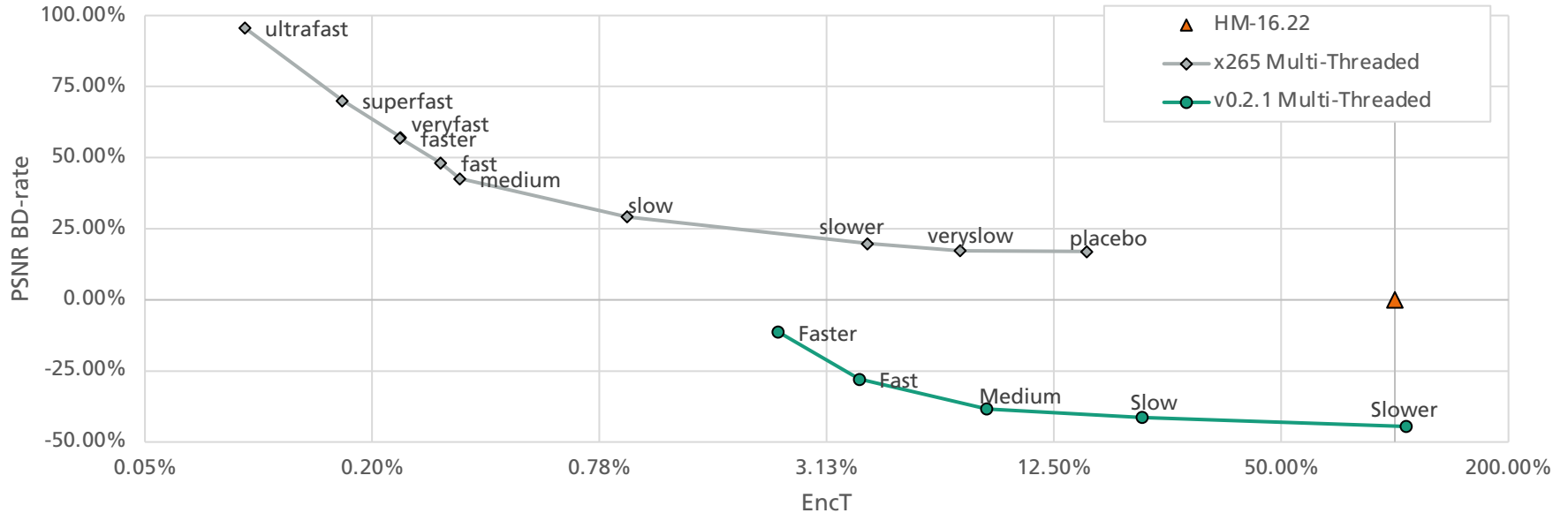
VVenC: Runtime vs. PSNR BD-rate



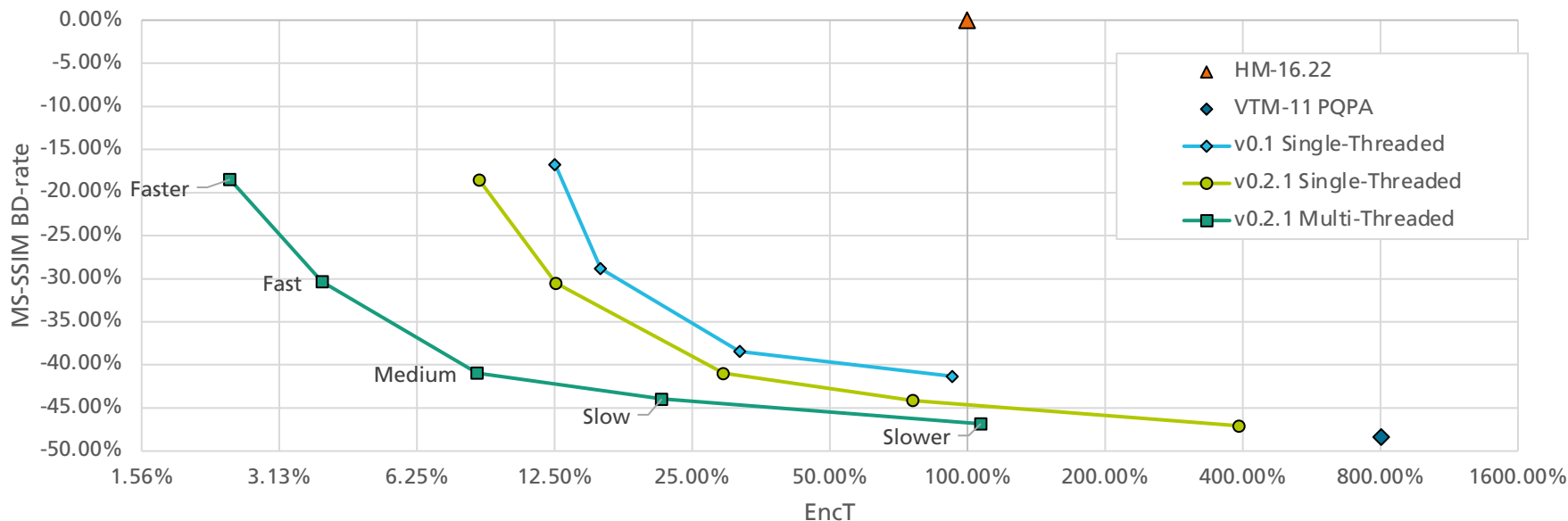
# VVenC

## JVET CTC Performance – YUV PSNR for HD und UHD

### VVenC: Runtime vs. PSNR BD-rate



### Perceptually Optimized QPA



### Perceptually Optimized QPA

