XXXIII SIC SALÃO INICIAÇÃO CIENTÍFICA

Evento	Salão UFRGS 2021: SIC - XXXIII SALÃO DE INICIAÇÃO CIENTÍFICA DA UFRGS
Ano	2021
Local	Virtual
Título	QUALITY AND COMPLEXITY ASSESSMENT OF LEARNING-BASED IMAGE COMPRESSION SOLUTIONS
Autor	JOÃO ATZ DICK
Orientador	SERGIO BAMPI

QUALITY AND COMPLEXITY ASSESSMENT OF LEARNING-BASED IMAGE COMPRESSION SOLUTIONS

João Dick[1], Brunno Abreu[1], Mateus Grellert[2], Sergio Bampi[1]
[1]Informatics Institute (PGMICRO), Federal University of Rio Grande do Sul, Porto Alegre, Brazil
[2]Graduate Program in Computer Science, Federal University of Santa Catarina, Florianópolis, Brazil

The demand for multimedia services has experienced a huge increase in the latest years, making image and video content account for most of the web's data traffic. To address this issue, compression solutions are of utmost importance. When compressing an image, the main goal is to reduce the image file size as much as possible with minimal loss of quality, which has to be quantified by a particular visual quality metric. This work presents an analysis of state-of-the-art learning-based image compression techniques. We compare 8 models available in the Tensorflow Compression package in terms of visual quality metrics and processing time, using the KODAK data set. The results are compared with the Better Portable Graphics (BPG) and the JPEG2000 codecs. Results show that JPEG2000 has the lowest execution times compared with the fastest learning-based model, with a speedup of 1.46x in compression and 30x in decompression. However, the learning-based models achieved improvements over JPEG2000 in terms of quality, especially for lower bitrates. Our findings also show that BPG is more efficient in terms of PSNR, but the learning models are better for other quality metrics, and sometimes even faster. The results indicate that learning-based techniques are promising solutions. The paper that resulted from this work was accepted at the 2021 IEEE International Conference on Image Processing (ICIP) and can be seen at https://arxiv.org/abs/2107.09136.