



XXXV SALÃO de INICIAÇÃO CIENTÍFICA

6 a 10 de novembro

Evento	Salão UFRGS 2023: SIC - XXXV SALÃO DE INICIAÇÃO CIENTÍFICA DA UFRGS
Ano	2023
Local	Campus Centro - UFRGS
Título	Poda adaptativa de transformada baseada na latitude para compressão de imagens 360?
Autor	ENZO BORGES SEGALA
Orientador	THIAGO LOPES TRUGILLO DA SILVEIRA

High-resolution 360 media are commonly used for novel and immersive applications, such as virtual reality scenarios and robotics. The equirectangular projection (ERP) is the de facto planar representation of 360 media. For topological reasons, any sphere-to-plane mapping introduces distortions, resulting in redundancies. The main goal of the project is to explore these redundancies for 360-degree image compression. The JPEG standard is still widely used for image compression purposes; however, it doesn't address the ERP image redundancies near the poles, thus computing much more information than needed to reconstruct the image. We propose a novel methodology to tackle this problem, where a geometrical, latitude-adaptive prune is applied to the core transform in the JPEG standard – the discrete cosine transform (DCT). That is, we discard rows in the DCT matrix, reducing the spectral domain to a concise subset with most of the non-zeros coefficients while also reducing the algorithm complexity. The proposed method performs virtually the same as JPEG, requiring, on average, 23% and 26.5% fewer additions and multiplications when processing high-resolution ERP images. Our approach has comparable image quality and bitrate to state-of-the-art works. Also, this technique can be coupled with fast algorithms, low-complexity transforms and latitude-adaptive quantization for further improvements.