A quantum Jensen-Shannon graph kernel for unattributed graphs

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In this paper, we use the quantum Jensen–Shannon divergence as a means of measuring the information theoretic dissimilarity of graphs and thus develop a novel graph kernel. In quantum mechanics, the quantum Jensen–Shannon divergence can be used to measure the dissimilarity of quantum systems specified in terms of their density matrices. We commence by computing the density matrix associated with a continuous-time quantum walk over each graph being compared. In particular, we adopt the closed form solution of the density matrix introduced by Rossi et al. (2013) to reduce the computational complexity and to avoid the cumbersome task of simulating the quantum walk evolution explicitly. Next, we compare the mixed states represented by the density matrices using the quantum Jensen–Shannon divergence. With the quantum states for a pair of graphs described by their density matrices to hand, the quantum graph kernel between the pair of graphs is defined using the quantum Jensen–Shannon divergence between the graph density matrices. We evaluate the performance of our kernel on several standard graph datasets from both bioinformatics and computer vision. The experimental results demonstrate the effectiveness of the proposed quantum graph kernel.

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8K cinema low latency compression in the frame of JPEG XS

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Image sequences have been transmitted and stored in uncompressed form in many cases, such as in professional video links (3G/6G/12G-SDI), IP transport (SMPTE2022 5/6 & proprietary uncompressed RTPs), Ethernet transport (IEEE/AVB), and memory buffers. JPEG-XS standardization subgroup is developing a low-latency lightweight image coding system allowing an increased resolution and frame rate, while offering visually lossless quality with reduced amount of resources such as power and bandwidth at a reasonable level. The upcoming JPEG XS standard will offer a low-latency lightweight image coding system that is able to support increasing resolution (such as 8K) and frame rate in a cost effective manner. We will show the main principle behind the reference model of JPEG-XS and the current performances. It is based on a low-latency wavelet transform and efficient ad-hoc entropy coding. Current developments are aiming to issue a standard for the early 2018.

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