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# A Visual Quality Evaluation Method for Telemedicine Applications

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**Abstract**—We present a new approach for image and video quality evaluation in telemedicine applications, relying on analyzing the quality of a pre-known reduced size logo embedded in an unused part of the medical ultrasound frame. The method is tested using two different objective metrics, namely: the Peak Signal to Noise Ratio (PSNR) and the Structural SIMilarity index metric (SSIM). Comparisons with subjective results in terms of Differential Mean Opinion Scores (DMOS) are also presented. We show that the presented method, not needing the original frame to predict the quality, achieves a high correlation with subjective results (more than 0.9) for the different quality metrics used. We also present relationships between the quality derived via the logo and via the original frame and we assess the overhead in data transmission resulting from the compressed logo data and its protection overhead.

**Index Terms**—Visual quality evaluation, medical ultrasound, objective quality metrics, subjective quality metrics, medical quality of service/experience, wireless telemedicine

## 1. INTRODUCTION

Recently, there has been a large interest in electronic and mobile healthcare applications making use of advances in multimedia content processing and emerging high data rate wireless transmission standards [1-6]. Quality of Service / Quality of Experience (QoS/QoE) is an important aspect in assessing the validity and reliability of multimedia telemedicine applications [6-11]. There is therefore a need to develop efficient and accurate image and video quality assessment (IQA/VQA) methodologies that enable a physician or a medical specialist to have enough confidence to use the medical data (*e.g.* a medical ultrasound scan) for diagnosis purposes even after processing and transmission

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