INTISARI

ANALISIS DAN EVALUASI OBJEKTIF TERHADAP DEGRADASI KUALITAS TRANSMISI AUDIO DALAM *NETWORKED MUSIC PERFORMANCE* DAN *WEBRTC*

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Networked Music Performance (NMP) marak digunakan oleh musisi di dunia semenjak pandemi Covid19 di tahun 2020, memungkinkan untuk bermain musik bersamaan walaupun terpisahkan jarak. Namun, walaupun tercatat latensi sistem tersebut dapat mencapai angka +- 25 ms di berbagai platform seperti Jacktrip, Jamulus, atau Soundjack, namun hingga saat ini kualitas transmisi audionya masih belum teruji secara objektif.

Penelitian ini bertujuan untuk mengetahui kualitas transmisi audio pada NMP menggunakan metode *Objective Perceptual Evaluation* berbasis MOS. Sepuluh jenis suara ditransmisikan menggunakan tiga platform NMP kemudian direkam ke dalam format audio. Audio asli dan rekaman kemudian dibandingkan dan dianlisis kualitasnya. Algoritma ViSQOL dan PEAQ digunakan sebagai metode pengukuran, khususnya pada kualifikasi fullband (20 Hz -24k Hz) yang dimiliki oleh kedua algoritme. Metode SSNR dan PAQA MOS-LQS juga diterapkan sebagai pembanding. Platform Jacktrip, Soundjack, dan Jamulus mewakili platform NMP diuji, sedangkan platform komunikasi WebRTC dan Zoom juga diuji sebagai komparasi.

Hasil penelitian mengungkapkan bahwa platform Soundjack dan Jacktrip jika dikonfigurasi dengan baik akan menghasilkan transmisi audio dengan kualitas yang tinggi, memiliki skor berturut-turut 4,69 dan 4,68 dari maksimum 4,75 dalam penilaian MOS-LQO ViSQOL, yang berarti terjadi hanya sedikit penurunan kualitas.

Kata Kunci: Networked Music Performance, Objective Perceptual Evaluation, PEAQ, ViSQOL, PAQA, SSNR, Mean Opinion Score

ABSTRACT

OBJECTIVE ANALYSIS AND EVALUATION OF AUDIO TRANSMISSION QUALITY DEGRADATION IN NETWORKED MUSIC PERFORMANCE AND WEBRTC

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In 2020's Covid19 pandemic situation, a fraction of musicians in the world tend to use Networked Music Performance (NMP) to play music together in isolation across countries. The NMP platform, like Soundjack, Jacktrip, or Jamulus although having very minimal latency at +- 25 ms at its finest, never happened to be objectively tested for its audio transmission quality yet.

This research measures the audio transmission quality produced by NMP platform objectively using Objective Perceptual Evaluation based MOS scoring. Ten different audios have been transmitted across three platforms of NMP network then captured as an audio recording. The original audios and its recordings were then compared and analysed of its quality. The ITU standards PEAQ and ViSQOL algorithm, which have a full-bands audio (20-20kHz) qualification, were used in this research. MOS-LQS PAQA and SSNR method were also used as comparison for measurements. The NMP platform tested were Jacktrip, Soundjack, and Jamulus, while WebRTC and Zoom platform are also measured.

The result reveals that if well configured, the Soundjack and Jacktrip can produce high quality audio transmission with score of 4,69 and 4,68 out of 4,75 respectively for MOS-LQO ViSQOL measurement, meaning quality degradation is moderately happened in NMP transmission.

Keywords: Networked Music Performance, Objective Perceptual Evaluation, PEAQ, ViSQOL, PAQA, SSNR, Mean Opinion Score