Dear Associate Editor and Editor,

We are pleased to submit our manuscript, titled ''Quantization-aware Matrix Factorization for Low Bit Rate Image Compression", for consideration in Information Sciences. In this paper, we introduce a quantization-aware matrix factorization (QMF) formulation to develop a novel lossy image compression method.

Unlike traditional image compression methods, the proposed approach integrates quantization into the compression process rather than treating it as a separate step. Our QMF formulation provides a low-rank representation of image data as the product of two smaller factor matrices. Quantization is integrated by introducing constraints in the optimization process, where the elements of the factor matrices are constrained to bounded integer values, effectively integrating quantization with low-rank approximation. The proposed QMF compression method, realized by a provably convergent iterative algorithm with subproblems having closed-form solutions, outperforms JPEG, particularly at low bit rates, while preserving visual quality and semantic fidelity. We strongly believe that this paper will be of great interest to the readers of Information Sciences as it bridges the gap between factorization and quantization.

This manuscript is the original work of the authors and has not been published or submitted elsewhere. All authors have reviewed the manuscript and approved its submission to Information Sciences.

We would like to thank you for considering our manuscript for publication. Please do not hesitate to contact us at pooya.ashtari@esat.kuleuven.be should you have any questions.

Sincerely,

Pooya Ashtari
On behalf of all the authors