

Review of: "A Novel Variable Neighborhood Search Approach for Cell Clustering for Spatial Transcriptomics"

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Potential competing interests: No potential competing interests to declare.

Overall, it is a good paper for publication,

This paper introduces a new approach to cell clustering using the Variable Neighborhood Search (VNS) metaheuristic.

The purpose of this method is to cluster cells based on both gene expression and spatial coordinates. Initially, we confronted this clustering challenge as an Integer Linear Programming minimization problem. Our approach introduced a novel model based on the VNS technique, demonstrating efficacy in navigating the complexities of cell clustering. Notably, our method extends beyond conventional cell-type clustering to spatial domain clustering. This adaptability enables our algorithm to orchestrate clusters based on information gleaned from gene expression matrices and spatial coordinates. Our validation showed the superior performance of our method when compared to existing techniques. Our approach advances current clustering methodologies and can potentially be applied to several fields, from biomedical research to spatial data analysis.