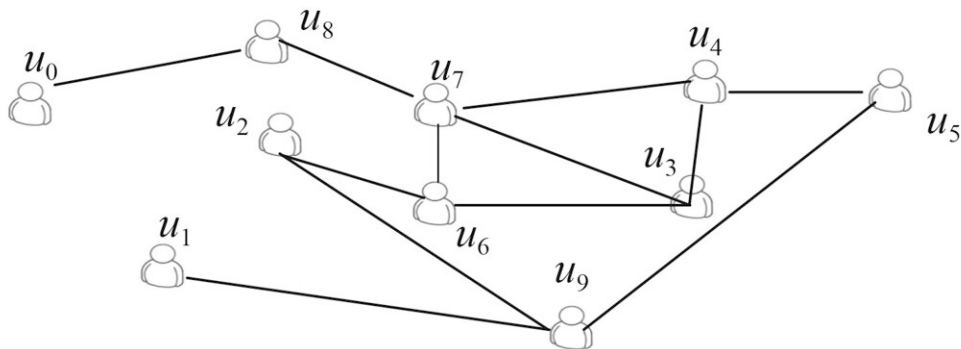


Algorithms developed to tackle tenuous group query

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Graphical abstract. Credit: *Frontiers of Computer Science* (2022). DOI: 10.1007/s11704-022-1462-5

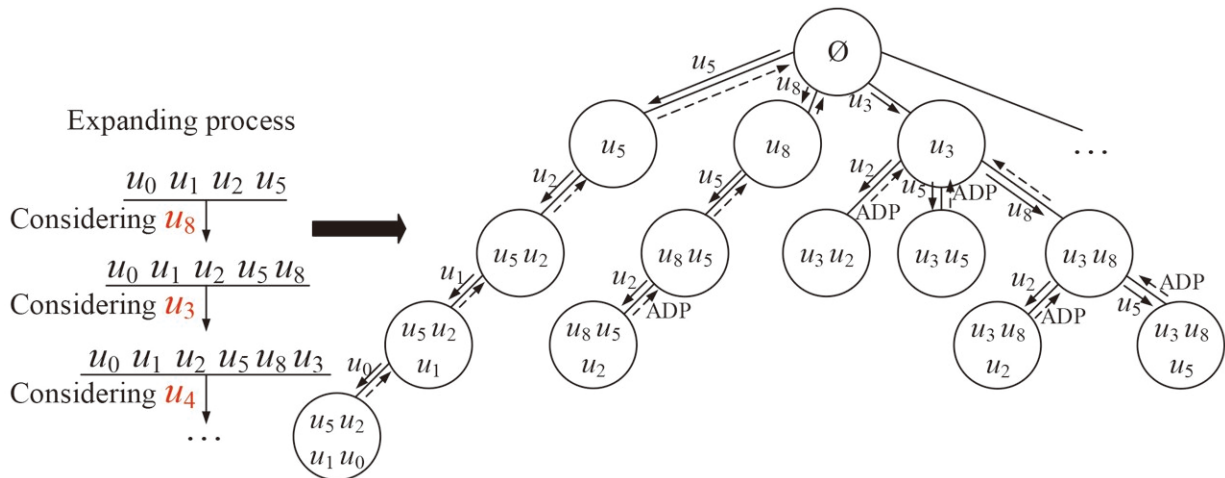
Finding tenuous groups, those with few social interactions and weak relationships among members, has been a hot topic in community search for reviewer selection and psycho-educational group formation. The existing metrics (e.g., k-triangle, k-line, and k-tenuity) used to measure the tenuity require a suitable k value to be specified, which is difficult for users without background knowledge.

A research team led by Huaijie Zhu has proposed several approaches to tackle this problem. The first is an exact algorithm, named MTG-VDIS, which selects those vertices whose vertex distance is large to generate the result group. It also utilizes effective filtering and pruning strategies.

Since MTG-VDIS is not fast enough, the team designed an efficient exact algorithm, called MTG-VDGE, which exploits the degree metric to sort the vertexes and proposes a new combination order, namely degree and reverse based branch and bound (DRBB). MTG-VDGE gives priority to those vertices with a small degree. For a large p , the team developed an approximation algorithm, named MTG-VDLT, that discards candidate attendees with high degree to reduce the number of vertices to be considered.

The algorithms are published in *Frontiers of Computer Science*.

In the experiments, the researchers compared the proposed algorithms with the following performance metrics: (1) query time, (2) distance of the result, (3) average group distance of the result, (4) the accuracy score S of the result of the approximation [algorithm](#).



The example of MTG-VDEG. Credit: Higher Education Press Limited Company

They also conducted a [case study](#) to show the usefulness of MTG-VDLT

and MTG-VDGE on LA dataset. Experimental results on real datasets manifest that MTG-VDGE outperforms MTG-VDIS in efficiency. For MTG-VDLT, compared with KLMA, the result obtained by MTG-VDLT has a higher accuracy score.

Future work may focus on finding more suitable and flexible metrics to obtain a tenuous group, such as using a machine-learning based method to learn the k value from users' history data.

More information: Na Li et al, The most tenuous group query, *Frontiers of Computer Science* (2022). [DOI: 10.1007/s11704-022-1462-5](https://doi.org/10.1007/s11704-022-1462-5)

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