Bi-directional A* Algorithm and its applications in shortest path finding in road networks

Project Code: BPV02
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Objectives:

- **Finding the shortest path in a dynamically varying Graph.**

- We propose to explore the Bi-directional A* algorithm and its variants [1].
- Task-1: To implement BFS, Uniform cost search, A* search and its bi-directional variants.
- Task-2: To study the effect of dynamically adding/deleting an edge to/from the graph.
- Task-3: To study the effect of both nodes and edges being added or deleted.

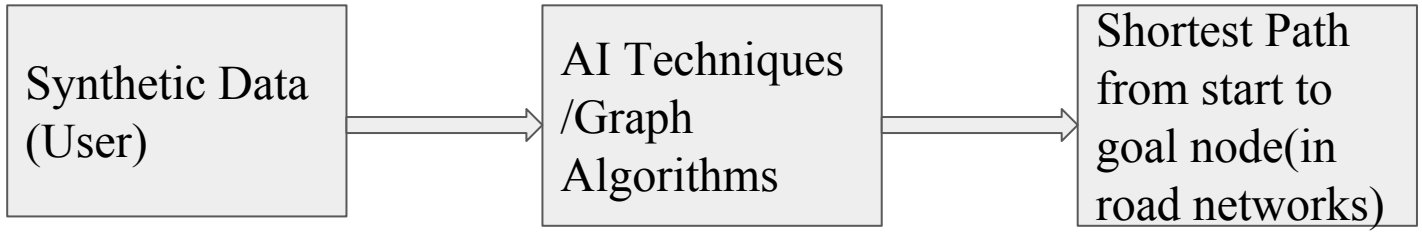
Scope of the proposed work

- AI and Graph Algorithm techniques are used.
- To speedup the search process, we propose to use

  Case Based Reasoning: New problems are solved by reusing and if necessary adapting the solutions to similar problems that were solved in the past.

  Graph Indexing: Storing reusable information related to the graph so that shortest path finding can be done quickly.

Workflow Diagram



Applications and Future work

Applications:

- Road networks
- DNA analysis
- Social media

Future work:

- Dynamic graphs
- Graph Indexing