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Assignment - ②

Q) Explain following approaches for robot motion planning in detail:-

* **Roadmap Approach:-**

This approach is dependent upon the concept of configuration space and a continuous path. A set of one-dimensional curve each of which connect two nodes of different polygonal obstacles lie in the free space and represent a roadmap R. this is all the line segments that connect a vertex of one obstacles to a vertex of another without entering the interior of any polygonal obstacles are drawn. This set of path is called roadmap.

* **The Cell decomposition approach:-**

The basic idea behind this method is that a path between the initial configuration can be determined by subdiving the free space of the robots configuration into smaller region called cells. After this decomposition a connectivity graph is contract according to the adjacent relationship b/w cells where the nodes represent the cells in the free space and the

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(b) links b/w the nodes show that corresponding cells are adjacent to each other.

(*) .Sampling based method :—

Sampling based motion planning uses randomization to construct a graph or tree (roadmap) in — C-shape or queries may be solved. We explore different general purpose techniques to improve planner performance. Some technique adopt to different inputs bias planning via features of the environment or via the medial axis or empty user guidance to more efficiently plan we also have general purpose algo. for handling moving object or constrained system using reachable volumes or by iteratively relaxing them.

Q) Provide a Comparative study among all.

Sol→ The tasks of planning trajectories plays an important role in transportation robotics, information system.

Research on path planning has yielded.

many fundamentally different approaches to the solution of the problem that can be classified as roadmap method (visibility graph method · vuonoi diagram) and method metray based on cell decomposition.

Roadmap method.

→ Applied computing.

→ Physical science and engineering

→ · Mathematics and Statistics

→ Computing methodologies

Artificial Intelligence ·

→ computer version

Image and video acquistion

→ motion capture.

→ control method.

robotic planning.

↘ planning and scheduling ·

robotic plannin

→ Computer graphics

Animation

→ motion capture

→ motion processing.

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Cell decomposition.

→ Computer system organise.

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Embedded and cyber physical system

↓

robotics.

→ Mathematics of computing

↓

Discreate mathematics

↓

Combination

↓

Combinational algorithm.