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### **Robot Path Planning Using Geodesic**

The present work proposes an improved geodesic algorithm for the trajectory planning of multi-joint robots. First, all of the joint variables are chosen to set up a generalized local coordinate sys... An improved geodesic algorithm for trajectory planning of multi-joint robots - Youdong Chen, Ling Li, Wei Tang, 2016 Skip to main content

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## **An improved geodesic algorithm for trajectory planning of ...**

Abstract: The state-of-the-art Kuka youBot is an open-source robot platform. In order to improve youBot arm manipulation performance, a novel robotic trajectory planning method based on geodesics is used for Kuka youBot arm shortest path trajectory planning in this paper. Geodesic is the necessary condition of the shortest length between two points on the Riemannian surface in which the covariant derivative of the geodesic's tangent vector is zero.

## **Kuka youBot arm shortest path planning based on geodesics ...**

Using the proposed metric, we prove that the geodesic in the 3-D tensor space leads to rational path-planning results by experiments. Compared to traditional methods, the results reveal the advantages of the proposed method in terms of

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smoothing the robot maneuver while considering the minimum travel distance.

## **Robotic Online Path Planning on Point Cloud - IEEE ...**

2 Geodesic path, geodesic length and tortuosity The actual mathematical problem of path planning can be posed as follows: The configuration space  $C$  is the space where the robot and obstacles are identified by their positions and orientations. Let  $R$  be a robot within a configuration space  $C$  and let  $p_0$  and  $p_g$  be its initial and final configurations in  $C$ .

## **PATH PLANNING BASED ON GEODESIC LENGTH AND TORTUOSITY FROM ...**

Besides polynomials, geodesic functions can also be used to plan trajectories for joint robots. [9] [10] [11][12][13] The fundamental idea of the geodesic-based trajectory planning method is to ...

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## **Kuka youBot arm shortest path planning based on geodesics ...**

parameters, the traditional geodesic algorithm is improved so that it becomes capable of planning robot trajectories that include both the position and the orientation. To demonstrate the effectiveness of the improvement, trajectories are planned for two typical joint robots: one being a planar 3R and the other a spatial RRPP.

## **An improved geodesic algorithm for trajectory planning of ...**

The shortest/optimal path planning is essential for efficient operation of autonomous vehicles. In this article, a new nature-inspired meta-heuristic algorithm has been applied for mobile robot path planning in an unknown or partially known environment populated by a variety of static obstacles.

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## **Optimal path planning for a mobile robot using cuckoo ...**

The path planning method In this paper, the path which is traveled by the robot from a start position  $P_s(x, y)$  to an exit position  $P_e(x, y)$  with passing over all accessible positions and avoiding obstacles is named the global path planning for the coverage region.

## **The path planning of cleaner robot for coverage region ...**

Abstract A novel manipulator trajectory planning approach using geodesic is proposed in this paper. Geodesic is the necessary condition of the shortest length between two points on the Riemannian surface in which the covariant derivative of the geodesic's tangent vector is zero.

## **Manipulator Trajectory Planning Using Geodesic Method ...**

...

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Motion planning, also path planning is computational problem to find a sequence of valid configurations that moves the object from the source to destination. The term is used in computational geometry, computer animation, robotics and computer games. For example, consider navigating a mobile robot inside a building to a distant waypoint. It should execute this task while avoiding walls and not falling down stairs. A motion planning algorithm would take a description of these tasks as input, and

## **Motion planning - Wikipedia**

Download Citation | 3D path planning based on nonlinear geodesic equation | A lot of methods have been proposed for 2D path planning of mobile robot, which could be a mobile platform or a ...

## **3D path planning based on nonlinear geodesic equation**



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In this paper we propose Geodesic-VPC, a “partition” and “cover” strategy for a multi-robot system using Voronoi partitioning based on geodesic distance metric in the place of the usual Euclidean distance. Each robot is responsible for covering the corresponding geodesic-Voronoi cell using a single-robot coverage strategy.

## **Multi-robot Coverage Using Voronoi Partitioning Based on**

...

For industrial applications of robot arms in a manufacturing cell, path planning is an output of robotic task sequencing whose goal is to find an optimal sequence of multiple tasks to be completed by a robot (i.e., a travelling salesman problem with or without neighborhood) [1] and the path connecting the task sequence. The obtained path points are then converted into joint angles of robot arm via their inverse kinematics solver.

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### **Research Article Path Planning and Replanning for Mobile**

...

The GSA-based approach is expressed as an algorithm which computes an optimal path for a robot that travels from an initial point to a target point while avoiding all the known obstacles in the environment but also any other static or dynamic object that could appear in the path of the robot to the target point.

### **Optimal Robot Path Planning Using Gravitational Search**

...

We have presented an offline geodesic path planning and replanning procedure to produce a continuous path that a point robot with constant speed satisfying the maximum velocity constraint would follow on a 3D terrain without using boundary following on the obstacle surface as an integral portion of the path.

## **Path Planning and Replanning for Mobile Robot Navigation ...**

drive robot in 3D-terrains. Initially, a simple geodesic based navigation function is utilised that solves the path planning problem and creates a collision free path.

## **Geodesic motion planning on 3D- terrains satisfying the**

...

Each robot uses a grammar based genetic programming for figuring the optimal path in a maze-like map, while a master evolutionary algorithm caters to the needs of overall path optimality. Co-operation amongst the individual robots' evolutionary algorithms ensures generation of overall optimal paths.

## **Multi-robot path planning using co-evolutionary genetic**

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The path planning problem has been an essential topic in autonomous robotics. There are many new path planning methods that have been developed, and those using bioinspired algorithms attract extensive attention. This paper analyzes several bio-inspired algorithms and surveys recent developments of robot path planning. Swarm intelligence, evolutionary algorithms, and neurodynamics are three ...

### **A Survey on Robot Path Planning using Bio-inspired ...**

Geodesic curves are useful in many areas of science and engineering, such as robot motion planning, terrain navigation, surface parameterization, remeshing and front propagation over surfaces.

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