

# Graduate Student Research Seminar

## Fall 2023

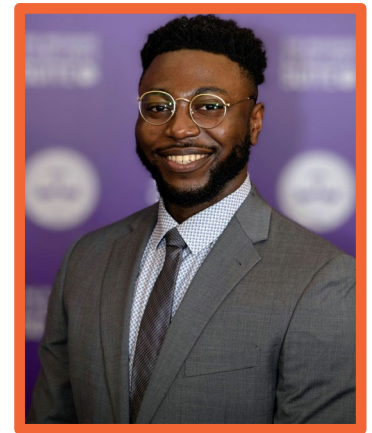
### Robot Path Planning and Application in Manufacturing Logistics

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**Monday, October 30<sup>th</sup>**

**3:00 pm (EST) – 132 Fluor Daniel Building**



### Abstract

In recent years, reports showcased growing trends in the e-commerce industry that use warehouse robots to cope with the high number of sales and delivery targets [1]. The consensus is to support human labor and maintain efficiency targets by automating navigation and translation of goods. According to a survey conducted by BIBA in 2007, robotics logistics fulfills a great need for modernization. Warehouse robots in the logistics industry have grown more favorably. This includes the complete planning, controlling, realization and testing of all institutions' internal and overlapping flow of goods and personnel [1].

Robotics logistics falls within the realm of motion planning. In this context, the primary objective is for robots to autonomously navigate through two-dimensional or three-dimensional spaces while avoiding obstacles in their environment to reach their designated destinations. Path planning is a subset of motion planning, specifically focused on finding a collision-free path based on geometric considerations without considering dynamics and motion duration. Path planning is vital in manufacturing logistics, primarily optimizing delivery times by minimizing travel distances, reducing collisions by avoiding obstacles and facilitating system-wide coordination among multiple robots. This presentation will explore offline path planning methods and demonstrate their use case with multiple robots in manufacturing.



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