

# Multiple Robot Simultaneous Localization and Mapping

Ebonie Williams  
enwillia@uncc.edu



Ebonie Williams  
From UNC Charlotte

## Introduction

Using multiple robots to explore an unknown area and generate a global map from each robot's local one is well-researched. The benefits of increased accuracy, reduced exploration time, and even safety are some of the motivations for using multiple robots for this process. Researchers refer to this as Simultaneous Localization and Mapping (SLAM). I researched and wrote a small literary survey about this research field.

## Background

Multiple robot SLAM is widely researched. These systems have been tested for large environments, indoors and outdoors, and with varying algorithms and number of robots.

Highlights of Research:

"Efficient Mapping Through Exploitation of Spatial Dependencies" by Yaron Rachlin, John Dolan, and Pradeep Khosla – created a use for multiple robots mapping to de-mine minefields

"Merging Occupancy Grid Maps from Multiple robots" by Andreas Birk, and Stefano Carpin – used occupancy grids in multiple robots without any need for the robots to find their relative locations (a common element of SLAM).

## Research

1. Have a group meeting about "what is a literary survey"
2. Choose literary survey topic
  - a. Multiple robot mapping process
3. Search for relevant research papers about topic
  - a. Read the paper's abstract and conclusion to determine if it's relevant
4. After gathering at least five sources, read them.
  - a. Write out any questions I had about the paper to research later
  - b. Write in the margins to summarize paragraphs
5. Develop a detailed outline for my literary survey
  - a. Think about general points each paper touched on
6. Write an abstract and introduction for my survey
  - a. Use feedback from lab advisor, Dr. Payton
7. Continue writing the rest of the paper

