

Explorer51 – Indoor Mapping, Discovery, and Navigation for an
Autonomous Mobile Robot

(Technical Report)

Transportation Automation and
Employment in the United States

(STS Research Paper)

An Undergraduate Thesis Portfolio
Presented to the Faculty of the
School of Engineering and Applied Science
In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Systems Engineering

by

William Holincheck

date submitted, in May 7, 2020

Preface

Automation can increase productivity, reduce costs, improve safety, and relieve humans of drudgery, but it can also introduce new hazards and inequities, induce risk compensation, and displace employment.

With automation, search and rescue operations can be less difficult and hazardous. The research team designed a robotic rover to map search areas and tag points of interest. LiDAR and tracking and depth cameras collect data. The team used libraries and wrote software to turn sensor data into maps and to track positions on the map. Given more time, the team would have programmed the robot to move autonomously to a set position.

Automation may transform surface transportation. In the U.S., developers of automated vehicle systems seek jurisdictions where the regulations governing automated vehicles are lax. Professional drivers organize to protect their jobs from automation.

List of Contents

1. Preface
2. Technical Report: Explorer 51 – Indoor Mapping, Discovery, and Navigation for an Autonomous Mobile Robot
3. STS Research Paper: Transportation Automation and Employment in the United States.
4. Prospectus