

Design and Construction of a Half Humanoid  
Half Rotunda Robot: Rotundaur  
(Technical Report)

Impediments to Optimum Workplace Automation  
(STS Research Paper)

An Undergraduate Thesis Portfolio  
Presented to the Faculty of the  
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Bachelor of Science in Mechanical Engineering

by

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## **Preface**

How do social groups adapt to automation? Automation can improve health, comfortability, and safety, but understanding the relationship between people and automation is necessary for a safe and effective merging of new systems.

How can an authorized user's attention at the MILL's laser cutter be ensured during a running operation? Development of this project ended before completion due to personnel and budget constraints. Primary design of a platform capable of detecting a user's weight, ensuring the user remained present, and a mechanized chair to transport the user from computer to printer were completed. Construction was halted, as production hours and funding could not be sourced. Assets were recommitted to the design and construction of a mobile, user-interactive robot to serve as a tour guide for the Mechanical Engineering Building at the University of Virginia. For prospective students, the robot is an example of what they may experience at UVA. It should be programable to give tours autonomously and respond to voice commands. At project completion, the robot is fully constructed with a 3-D printed body, custom circuitry, holonomic drive wheels, articulating arms, and grasping claws. Autonomous operation was not completed but the robot is fully controllable by remote. Personnel with programming expertise would be necessary for future improvement.

How do critics and promoters of workplace automation influence its extent? Automation is ubiquitous in applications ranging from coffee makers to fully robotic factories. To safely and effectively merge new systems, workers, policy makers, and automation developers must understand the relationship between people and automation. Both critics and promoters of workplace automation influence its extent, often in ways that limit its efficacy.

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