

## **Thesis Portfolio**

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

**A Comparative Study of the Plastic Recycling Systems in the US and China**  
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science  
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In Fulfillment of the Requirements for the Degree  
Bachelor of Science, School of Engineering

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## **Sociotechnical Synthesis**

The technical topic of this thesis will investigate the use of technology to create an interactive learning guide. This will be accomplished through the construction of a Humanoid robot. The challenge within this section is to keep the uncanny valley in mind in order to design a robot that wouldn't cross the boundary of comfort. This is considerably important because the robot would double as a tour guide and source of entertainment by being interactive while maintaining a theme unique to the University of Virginia. This had started as a continuation of a previous capstone design project that would entail adding legs to an existing humanoid robot. This project then evolved to the creation of an entirely new robot to allow for a greater range of creativity in the robot's aesthetic design and overall functionality. This decision led the team to not have prior design constraints and to establish these specified constraints. With new freedom of design in undertaking a completely new robot the team decided to take a unique approach to humanoid robot that would also be exclusive to UVA. The concept for the robot plays on the centaur from Greek mythology where the upper body is mounted on a base which is the Rotunda. This design gave rise to the current name which is Rotundaur. The STS topic takes the recycling system in two countries the US and China and compares the components and relevant actors within the two countries to unpack the underlying cultural differences. These components (actants) and actors are then shown and analyzed through the application of Latour's actant network theory (ANT). The Technical and STS topics of this thesis are not related.