

# **ONU HPVC Steering Innovation**

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## **Abstract**

The ASME Human Powered Vehicle Challenge (HPVC) is an annual design-based engineering competition. Teams from various engineering schools from across the country compete every year with their designs. One problem that ONU's HPVC team has consistently encountered in previous years of competition is the compromise required when choosing the steering ratio for the vehicle. This compromise comes from the combination of desired vehicle maneuverability and vehicle speed capability. A tight turning radius, which makes the vehicle very maneuverable at low speeds, makes the vehicle feel unstable and unsettled at higher speeds. The objective of this capstone project was to design, test, and build a steering system for the ONU ASME HPVC team. The steering system allows for both highly responsive steering at low speeds to aid in maneuverability and less sensitive steering at high speeds to aid in vehicle stability, safety, and rider confidence. This was accomplished by employing a linear actuator to vary the steering ratio and an Arduino board to control the system. The capstone team members will participate with the ONU team in the HPVC East competition in May to see the steering system for this vehicle from design, to manufacturing, to testing, and finally into use for competition.