

Tabletop Wind Tunnel Capstone Project for K-12 STEM Education

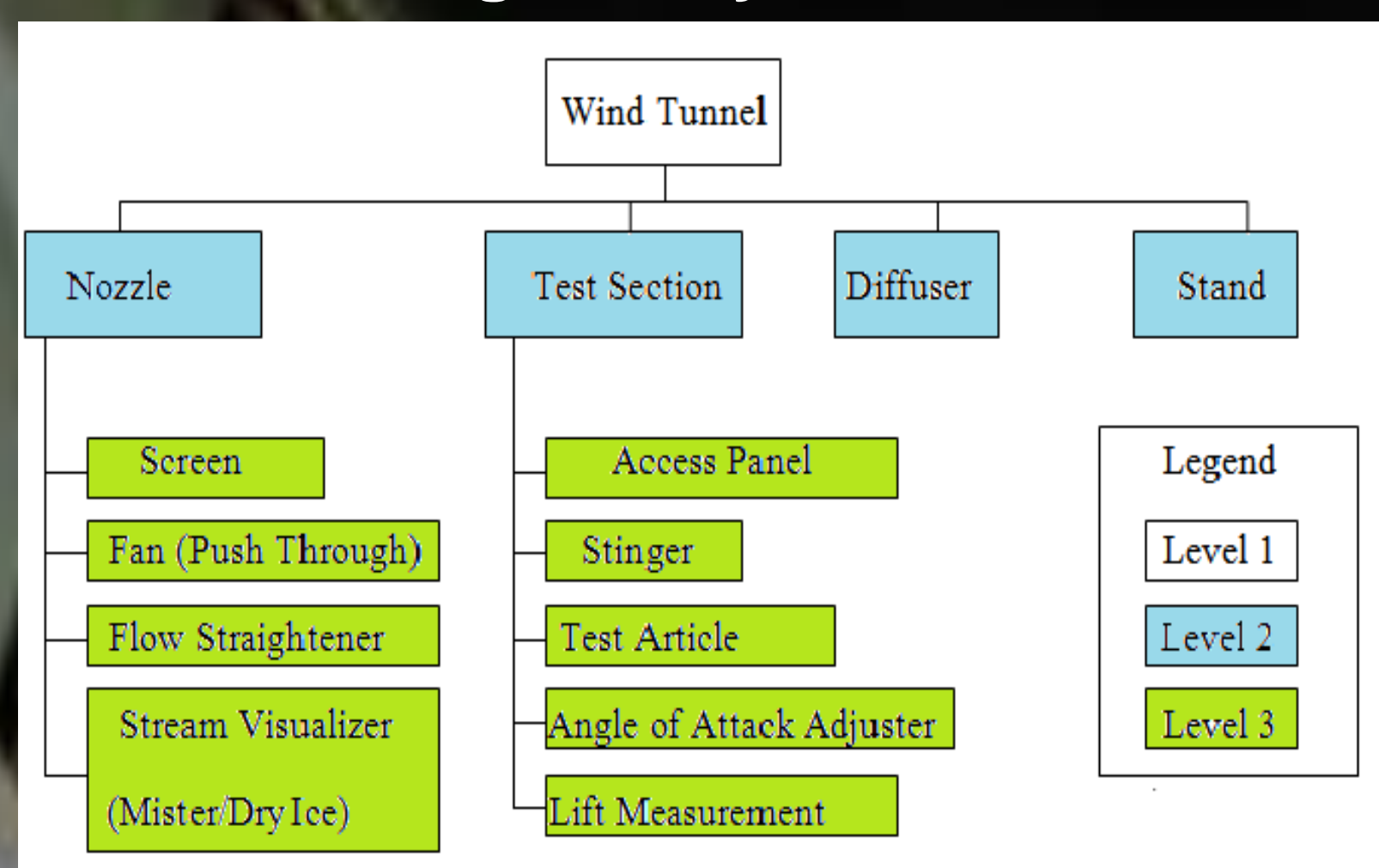
*Madison Bowersox, Creighton McIntyre, Prathmesh Anantwar, Kyle Clark, and
Abhee Singh— Department of Mechanical and Aerospace Engineering*

Overview

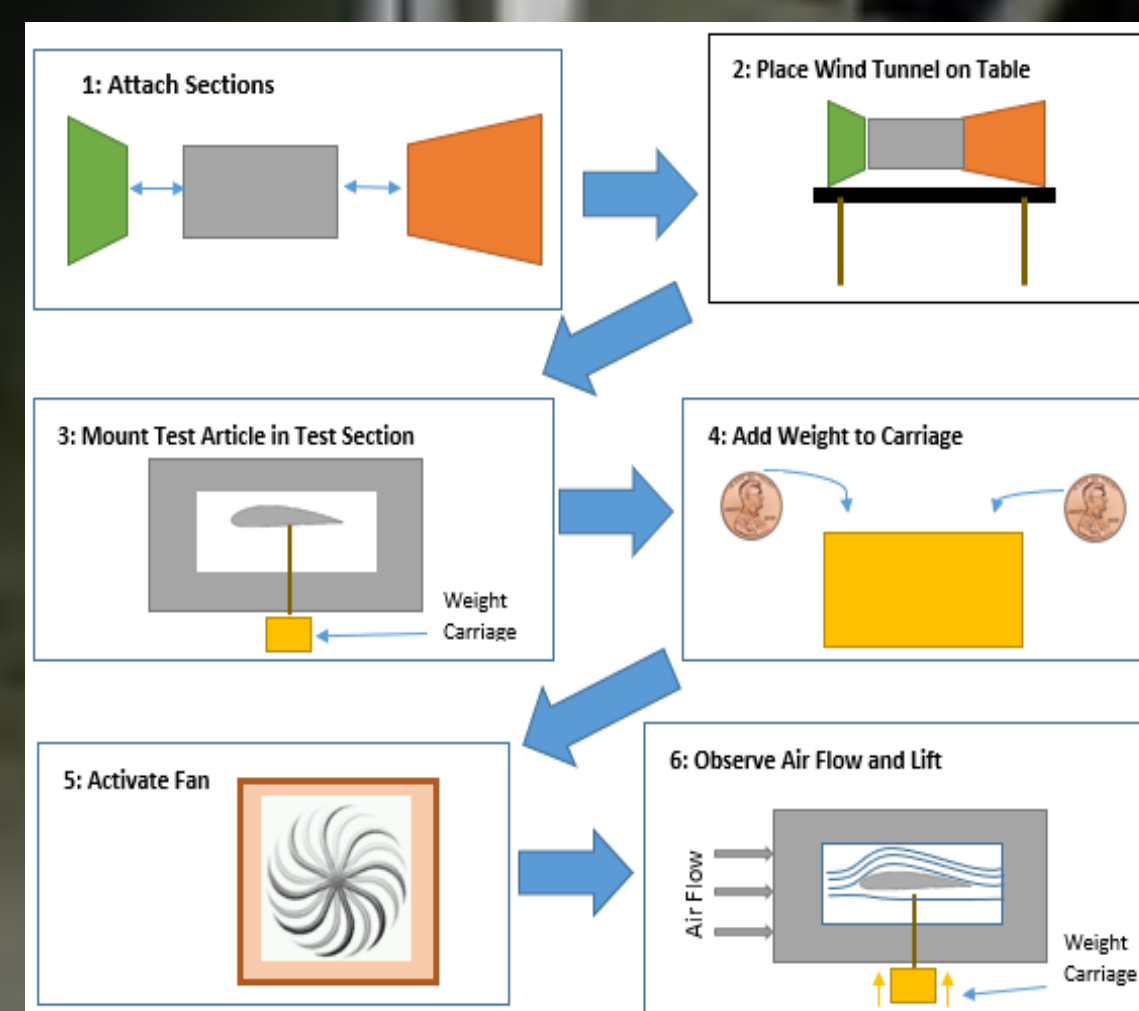
- An academic partnership between the University of Alabama in Huntsville (UAH) and the Cape Peninsula University of Technology (CPUT) in South Africa, known as the ALLiance for International Excellence among the future Space workforce (ALLIES), was formed in 2012
- This partnership has now extended to Costa Rica
- ALLIES is intended to develop the future space and Science, Technology, Engineering, and Mathematics (STEM) workforce by focusing on the following goals:
 - Establish collaborative efforts between universities in various nations
 - Provide undergraduate engineering students the opportunity to work on international engineering projects
 - Encourage Kindergarten through 12th grade (K-12) students to pursue careers in STEM fields

Objectives

- To design a wind tunnel for K-12 classroom demonstration by the UAH American Society of Mechanical Engineers (ASME) Student Section and North Alabama ASME section
- The wind tunnel shall be designed such that it is easily replicable in most any nation, using readily available materials



Product Breakdown Structure



Concept of Operations



CAD Renderings

Impact

- Ongoing senior design project (the 6th wind tunnel within this project series)
- Knowledge and research gained via the design and production of the current wind tunnel will continue to be used in K-12 STEM outreach in the North Alabama region as well as new efforts in Costa Rica
- Thus far, ALLIES has benefited thousands of K-12 students in South Africa and North Alabama
- The wind tunnel will be used for STEM outreach purposes by both the UAH ASME Student Section and the North Alabama Section of ASME
- Costa Rican University Student Teams will replicate the UAH design for STEM outreach purposes



<https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-are-wind-tunnels-k4.html>

Acknowledgements

The Tabletop Wind Tunnel design team would like to thank **Dr. Christina Carmen** (The University of Alabama in Huntsville Team Advisor and Senior Design Instructor) and **Mr. Herb Guendel** (STEM Outreach Contact for International Collaboration)