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## Hyperloop Pod Levitation Subsystem Testbed

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**Author Note:** Anzalone is an industrial engineering undergraduate student responsible for project management aspects such as scheduling and budgeting. Authors denoted as Authors2A-F are mechanical engineering undergraduate students responsible for the mechanical design and manufacturing of the testbed. Authors denoted as 3A-C are electrical engineering undergraduate students responsible for establishing control laws and selecting the appropriate sensors. Author4, Goldband, is a computer engineer responsible for programming components and the graphical user interface. The authors would like to formally acknowledge and thank Professor Kirill Zaychik, PhD for his invaluable contribution of intellectual guidance on this research project.

**Abstract:** The Hyperloop pod is a revolutionary, futuristic mode of transportation originally drafted by visionary Elon Musk mid-year of 2013. The pod is a passenger and cargo vessel that will traverse a depressurized tube at high velocity, and to do so the vehicle must levitate in order to ignore high frictional forces that would hinder reaching near supersonic speeds. The method of levitation used in this design is air bearing levitation. Air is externally pressurized to the bottom of the pod through orificed-steel to create the bed of air the pod will levitate upon. The testbed is a scaled subsystem prototype designed and manufactured to verify the plausibility of air levitation. Air is supplied by leaf blowers to the airski model and the airflow is controlled by an array of sensors to dynamically control a stable height of levitation.