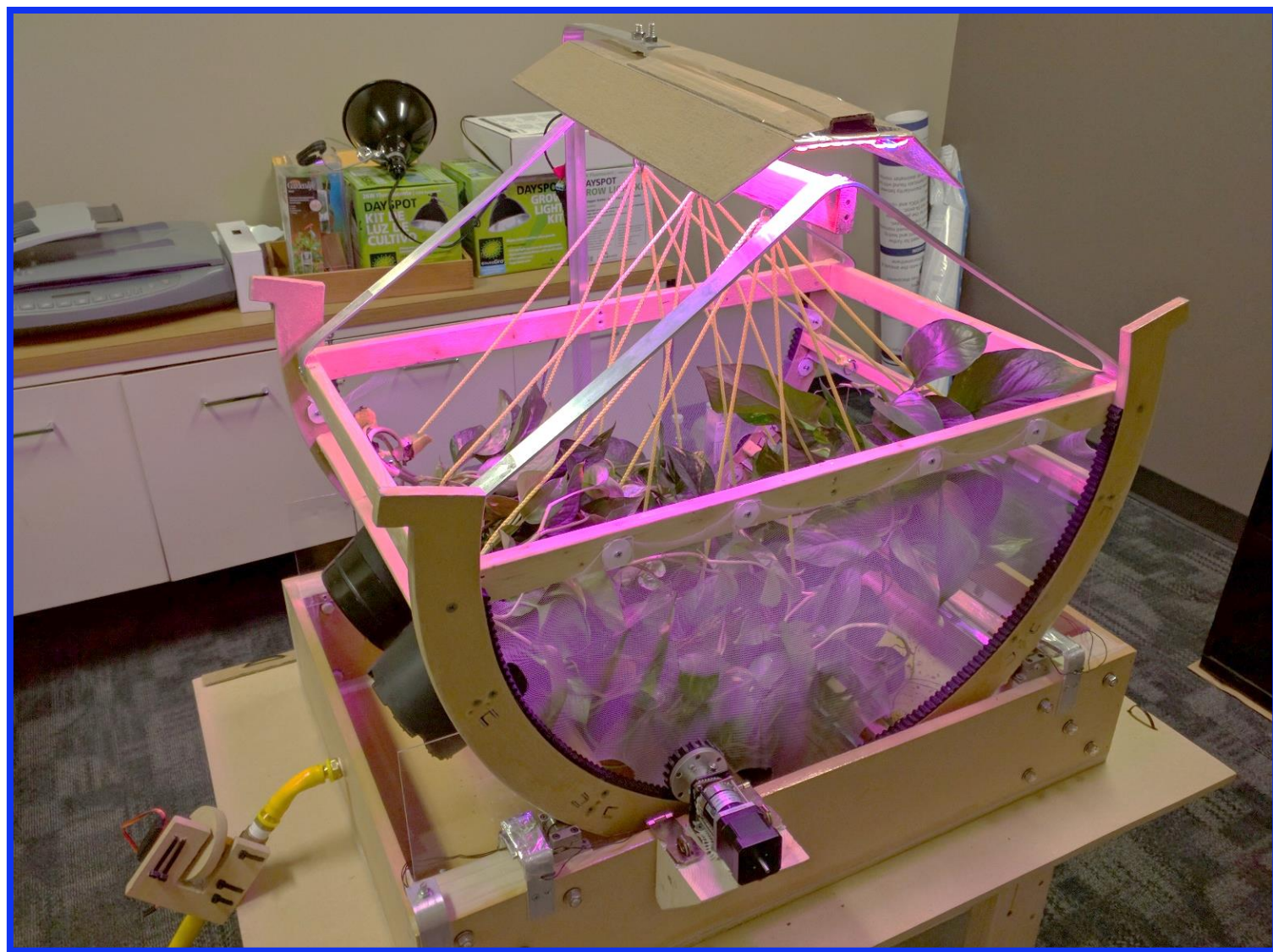


Rotary Vegetation System: Can It Speed Up the Absorption of Indoor Air Pollutants?

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Overview

- Indoor air pollutants, which are emitted from almost all building materials (e.g. paints, furnishings, carpet, ...) are linked to health effects, such as asthma, allergic reactions, cancer, and so on [1][2].
- Plants are known to have the capability to absorb the air pollutants and clean the air; however, it is not clear how continuous rotation of plant will affect their efficiency in cleaning the air [3].



Methodology

- A rotary vegetation system was designed and built to test plants' ability in speeding up the absorption of indoor air pollutants while rotating.
- The rotary vegetation system can rotate in different speeds, has preset watering and lighting schedules, can play music, and it can even dehumidify.
- Eco-friendly and low/zero-VOC materials are used.
- Golden Pothos, which is known as a clean-air plant, is used in this system
- VOCs and formaldehyde monitors are used to measure the level of air pollutants in different settings.
- First, the indoor air pollutants will be measured in a closed room with and without plants and with no rotation. Then the efficiency of plants in reducing indoor air pollutants will be tested in different rotational speed.
- The efficiency of the air pollutant absorption will be assessed by looking at the air pollutant level before and after each test.

Plans and Goals

- Test with different types of plants.
- Find out the best condition of each environmental factor for maximum air pollutant absorption.
- Provide better air quality in the university and public places using the same system.

References

- [1]. "Volatile Organic Compounds' Impact on Indoor Air Quality," in *US Environmental Protection Agency*, 2016. [Online]. Available: <https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality>. Accessed: Aug. 22, 2016.
- [2]. "Volatile Organic Compounds in Your Home," in *Minnesota Department of Health*, 2016. [Online]. Available: <http://www.health.state.mn.us/divs/eh/indoorair/voc/>. Accessed: Aug. 22, 2016.
- [3]. E. Main, "7 Plants That Purify Indoor Air," in *Rodale's Organic Life*, Rodale's Organic Life, 2016. [Online]. Available: <http://www.rodaleorganiclife.com/garden/7-plants-purify-indoor-air#>. Accessed: Aug. 22, 2016.

Acknowledgements

- Mr. Ryan Longchamp, Student in College of Engineering, UAH
- UAH Office of the President, Office of the Provost, and Office of the Vice President for Research and Economic Development
- Alabama Space Grant Consortium

