MS-GIST Projects Summer 2023
Monday, July 31

**** There will be 5 minute breaks between each back-to-back presentation to facilitate transitions in Zoom.***
***** Zoom links are available on request. Please contact Andrew Grogan - atgrogan@arizona.edu***

Date/Time	Presentation Title	Student Name
07/31/23 12:30 - 12:55 PM	DEVELOPMENT OF A CITY-WIDE TREE INVENTORY FOR THE CITY OF SEATTLE WASHINGTON	Connor Williams
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DEVELOPMENT OF A CITY-WIDE TREE INVENTORY FOR THE CITY OF SEATTLE WASHINGTON

Connor Williams
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07/31/23, 12:30 - 12:55 PM

Abstract:

Seattle is the largest city in Washington State and has an estimated tree canopy cover of 28.1%. The health of the urban forest is a critical part of what gives the city its identity, as well as providing important ecosystem services to the city's residents. The city is slowly losing its canopy through time, and the neighborhoods where canopy loss is happening the fastest have histories of economic and racial inequality. Various departments across the municipality are responsible for managing trees and they need to work together to manage the urban forest. Unfortunately, these departments each track only the trees they are directly responsible for. In this study I describe the methods used to design and create a combined tree inventory of all trees tracked and managed by the city of Seattle. I then use the resulting combined tree inventory to perform several example analyses that an urban forester at the city might perform. I found that this was a reliable method to manage the complex integration of many contributing data sources into a single, simple, user-friendly dataset while also supporting the inevitable changes made to the contributing datasets as business needs evolve.

Keywords: Trees, Urban Forestry, Model Builder, Python, City Government

Analyzing Potential Optimal Corridors for the Construction of a Lunar South Pole Oxygen Pipeline

Arthur Tyson
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07/31/23, 03:30 - 03:55 PM

Abstract:

The need to establish a permanent presence on the Lunar surface for scientific, as well as economic reasons has only gradually increased within the past 20 years. The Moon contains many precious elements such as Titanium, Aluminum, Iron, and a variety of other metals. These resources can be used for in-situ construction and development of Lunar infrastructure as well as extracted for Earth based economic prosperity. However, to feasibly plan for the construction of any type of mining operations, humans and drones must be able to sustain themselves without heavy reliance on Earth-based deliveries. The most essential material available to accomplish this lies in trapped ice located within the Polar regions which can be extracted and transported as gaseous oxygen from the source to a Lunar base using a pipeline. This project analyzes the Lunar terrain and soil content to propose multiple corridors most suitable for construction of a pipeline. Digital Terrain Elevation data and Lunar craters with an 8-mile buffer from the center as barriers were input to determine Distance Allocation. Using the Optimal Route Analysis Tool, Distance Allocation and direction degrees were analyzed to calculate the optimal pipeline routes. Results show three separate suitable routes from highest concentrations of Lunar ice to three potential Lunar bases. Routes differ based on distance, terrain, and proximity to suitable landing sites. The analysis of this project seeks to weigh each route based on factors of feasibility, thereby allowing for a proposed best route. This analysis will help provide potential options during future planning of a lunar pipeline as well as the locations for a Lunar base, and ice extraction site.

Keywords: Keywords: Lunar Exploration, Pipeline Moon, Mining Lunar, Extraterrestrial Excavation, Resources Moon, Lunar Base, Moon GIS