Speaker: Amy Wells

Title: Making Soils More Accessible Through the Use of Radiance Fields

Bio:

Amy Wells is a 2nd year master's student in the SoilRES3 Lab at the University of British Columbia. She is studying how industrial land management, and ancestral land stewardship have affected the stocks and cycling of soil silicon within forest ecosystems, as well as how the emerging technology of 3D Gaussian splat-based Radiance Fields can be applied to enhance soil science education, and science communication. Amy graduated from the UBC Sustainable Agriculture and Environment program in May 2024, following work done on how the UBC Farm benefited from a long-term student generated soil data set. She hopes to further develop new methods for communicating soil science and its research with community partners, students, and the broader public with the hope of inspiring others to learn more about soil.

Co-supervised by Drs. Jean-Thomas Cornelis & Maja Krzic in the UBC Faculty of Land and Food Systems

Abstract:

The application of new and innovative technologies provides a new avenue to make the diversity of soil, their environmental contexts, and land management histories far more accessible.

Conventional methods of soil science communication are limited in the ways they can share the diversity of soils through soil descriptions, photos and videos, and monoliths. Each of these methods have some limitations, be they limitations on how it can engage the viewer, a lack of critically important environmental context, or simply limited accessibility.

A potential solution that could provide an accessible and engaging experience that successfully captures both the soil, and the surrounding environment are Gaussian splats. Gaussian splats are a new and innovative technology that utilizes machine learning to re-create complex environments that can be later displayed within real-time web environments, and Virtual Reality (VR) experiences.

This paper aims to (1) to develop a standard method for the consistent capture of soil pits and their surrounding environments, and (2) outline how this technology could be applied in the field of soil science for communication, and education with further development.

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