Digital Topographies: Remote-Online Spot Elevation Surveying as a Learning Method

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Abstract:
Traditional site surveying is done in person and on site, often using electronic total stations and global positioning system (GPS) receivers. More recently, laser scanning using drones or in situ devices have served as an alternative method of site surveying. Using these methods as a means of education can be costly, abstract and hard to administer. This paper explores remote-online methods for site surveying and topographic education in landscape architecture pedagogy. Elevation data can be observed using Google Earth Pro and can be spatially mapped for any given site available on the platform. By using the computer curser, students can take note of elevation information and observe topographic features through real time first-hand remote site surveying.

The observation and annotation of relative elevation values allows for an applied, hands on experience into contour formation as an abstract representation of topography. This form of topographic investigation is a low-cost and accessible form of remote-online surveying education. By pairing this investigation with 3D modelling methods using Rhinoceros and the Lands Design Google Earth Scanning application, students can engage in multiple processes of understanding topography as a 2D and 3D digital trace of their sites of investigation. The act of manual data processing as an educational model is central to developing the skillsets of topographic articulation and analysis. This paper presents learning opportunities through the act of applied topographic data collection and manipulation. Data acquisition and manipulation is further supplemented with
ready-made Grasshopper scripts to allow for real time visualization of abstract concepts of topography including 3D digital mesh models, slope analysis and drainage analysis as derived from individual remote-online spot elevation surveying and interpolation.

Key Words: Landscape Architecture, Surveying, Topography, Google Earth Pro, CAD, Rhinoceros, Lands Design, Grasshopper.

• Author(s) Biography:
Vincent Javet is a Swiss-Canadian designer, researcher and educator. Formally trained as a landscape architect and urban planner, he is committed to studying environmental performance and developing innovative design and visualization methods for dynamic landscapes through both his design and research work.

Vincent serves as Instructor in Landscape Architecture at the School of Environmental and Biological Sciences, Rutgers University and as Sessional Lecturer at the Daniels Faculty of Architecture, Landscape and Design, University of Toronto. He has practiced in Canada, Europe, and the United States with renowned offices such as Unknown Studio, West 8 Urban Design and Landscape Architecture, and North Design Office.

Vincent’s work has been published in Ground Magazine, Landscape Architecture Magazine, Living Architecture Monitor, SimAUD, and the Harvard Graduate School of Design’s Studio Publication, Frontier City, among many others. In addition to his international design and teaching experience, Vincent has held research positions with the Green Roof Information Testing Laboratory (GRIT Lab) at the University of Toronto, and the environmental non-profit Green Roofs for Healthy Cities.