

Landscape Heatmap Simulation

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Photogrammetry software has progressed to such a degree that usable 3D models can be computed from a set of photos that a consumer drone has obtained during a single flight, without any additional laser scans necessary in addition.

We demonstrate how shadow mapping, a standard method for surface shadow computations in computer games, can be applied to this 3D model to compute the landscape's exposure to sunlight using plain WebGL running in a browser. WebGL has become a very useful tool to bring data visualization and game graphics to end users on a PC, smartphone or tablet without having to install executables, allowing for quick deployment.

We further demonstrate how GPGPU techniques can extend this shadowing simulation to create a "heatmap" of the landscape for sun exposure over a given timespan.

Landscape heatmaps can be useful in various situations of construction planning, such as solar panel construction (where maximum sun exposure at a good panel angle is desired), and architectural planning (where a minimum sun exposure per day is required for every window of the building). Your suggestions on additional application areas are welcomed.