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Inexpensive Reconstruction and Rendering of Realistic Roadside Landscapes

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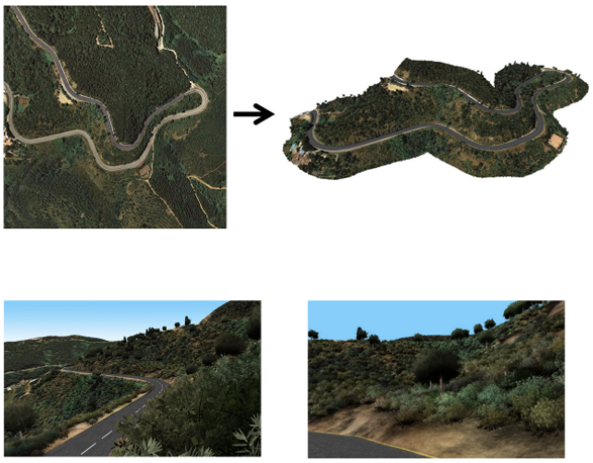

In this paper, we present an inexpensive approach to create highly detailed reconstructions of the landscape surrounding a road. Our method is based on a space-efficient semi-procedural representation of the terrain and vegetation supporting high-quality real-time rendering not only for aerial views but also at road level. We can integrate photographs along selected road stretches. We merge the point clouds extracted from these photographs with a low-resolution digital terrain model through a novel algorithm which is robust against noise and missing data. We pre-compute plausible locations for trees through an algorithm which takes into account perceptual cues. At runtime we render the reconstructed terrain along with plants generated procedurally according to pre-computed parameters. Our rendering algorithm ensures visual consistency with aerial imagery and thus it can be integrated seamlessly with current virtual globes.

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