

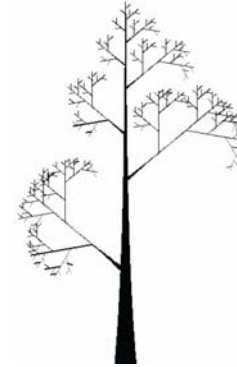
## SIMULATING FULL-WAVEFORM LIDAR

Angela M. Kim

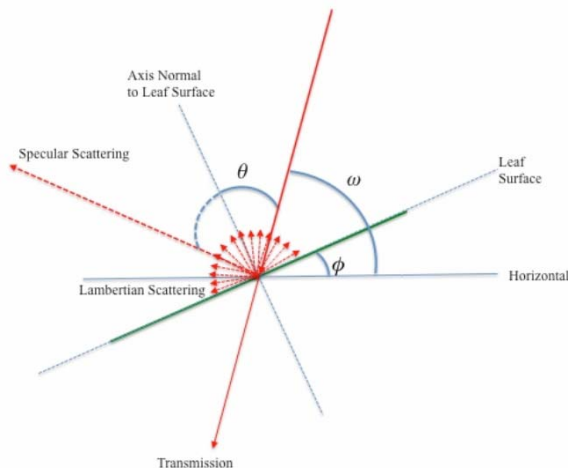
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Co-Advisor: Carlos F. Borges

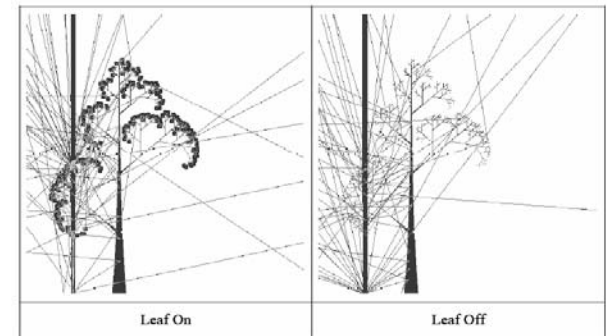
Co-Advisor: Richard Olsen



Monte Carlo model of laser propagation through a tree which allows simulation of full-waveform LIDAR signatures. The model incorporates a LIDAR system and a “natural” scene, including an atmosphere, tree and ground surface. Test cases are presented which enlighten various aspects of the model, and give insight into full-waveform LIDAR data collection and analysis.



Changes in the scene such as varying ground reflectance, sloped versus flat ground, and comparisons of “leaf-on” and “leaf-off” conditions are analyzed. Changes in the LIDAR system are also studied, such as changing laser wavelength, shape and length of transmitted pulses, sensing geometry, etc. Results of the simulations and analysis of the effects of physical changes in the scene and sensor are presented.



o Contact Information:  
Prof. RC Olsen  
831-656-2019  
olsen@nps.edu