**Precision forestry – current status of practical implementation and research problems**

Remote sensing has revolutionized the way we monitor and analyze forested areas, offering a new vantage point through advancements in technology. The emergence of laser scanning technology, particularly in the early 2000s, has enabled a more precise and automated approach to detailing the biometric characteristics of individual trees, surpassing the capabilities of earlier methods.

Currently, the market offers a variety of laser scanning technologies ranging from ground-based systems to those deployed on aircraft and satellites. Among these, Airborne Laser Scanning (ALS) stands out as the most seasoned technology, with several decades of application behind it. ALS allows for the identification of individual trees and the characterization of forest stands and ecosystems based on their traits. There is also a broad array of ground-based technologies, including mobile laser scanners (MLS), an assortment of personal laser scanners (PLS), and UAV Scanners (ULS). These technologies provide significantly improved spatial and temporal resolution, facilitating detailed assessments of tree structure, branching patterns, architecture, species identification, and dynamic changes over time.

Laser scanning is thus employed across various fields, from urban forestry to productive forestry and forest ecology, supporting tasks ranging from the characterization of city trees to global forest biomass mapping (e.g., GEDI). It serves different scales of analysis, including individual forestry operations, state-wide forests, and international forest ecosystem research. This presentation will showcase current examples of precision forestry using laser scanning, offering a structured review of its practical applications, limitations, and a look into ongoing research challenges and anticipated future developments.