

**Woodam Chung**, Oregon State University, College of Forestry, Dept Forest Engineering, Resources and Management, Corvallis, EUA



**Title:** *Computer vision technology for sustainable forest operations*

**Abstract:** Forest operations such as timber harvesting and restoration thinning is an essential part of sustainable forest management. A recently developed concept of sustainable forest operations demands a paradigm shift from conventional productivity and cost-driven forest operations toward a balance of operational performance across economic, environmental and social sustainability. In this presentation, we introduce computer vision technology as a new tool that supports sustainable forest operations. Specifically, we introduce a purpose-built camera system for forest harvesting machines for detecting and measuring individual trees in real-time. The computer vision algorithms developed for this system can estimate angle, distance, diameter at breast height and stem taper for trees while producing an accurate stem map of the stand. This individual stem information can be coupled with a silvicultural prescription to provide equipment operators with cut/leave decision aids enabling the implementation of individual tree-level treatments. The stem taper information coupled with optimal bucking can maximize value of wood products and minimize waste. Real-time stem mapping of residual trees can ensure treatment compliance for quality control of forest operations. As a tool to support sustainable forest operations, computer vision certainly has the potential to facilitate implementation of complex, ecology-based silvicultural prescriptions, improve both the working environment of humans and efficiency of forest operations, and maximize utilization, quality and value of wood products.

**Brief biography:** Woodam Chung is a Professor and Stewart Endowed Professor of Forest Operations in the Department of Forest Engineering, Resources and Management at Oregon State University (OSU). He received a BS and MS in Forestry from Seoul National University, South Korea, and a PhD in Forest Engineering from OSU. He is the current Coordinator of IUFRO Forest Operations Engineering and Management Division and is also the Chair of the Council on Forest Engineering (COFE), the Forest Engineering Society in North America.