The Institute for Man-Machine Interaction of RWTH Aachen University

Our objectives
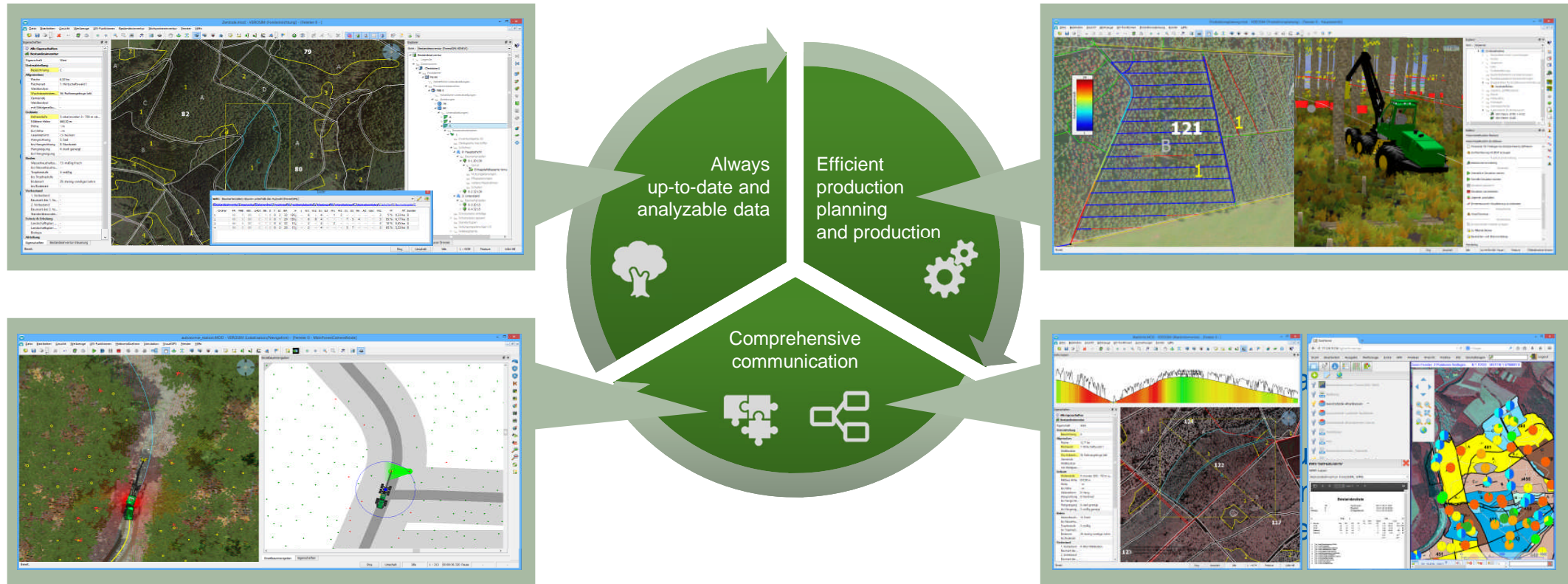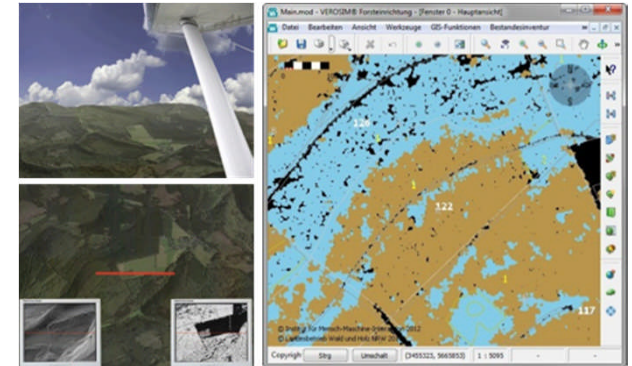
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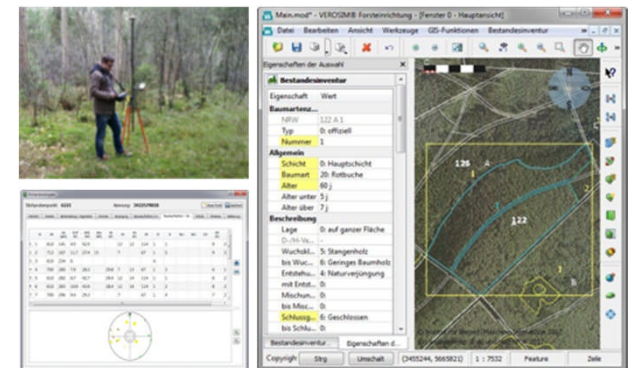# The Institute for Man-Machine Interaction of RWTH Aachen University

Expertise: Modeling, systems integration & simulation

- Remote sensing data processing
  - Data preprocessing
  - Tree species classification
  - Single tree delineation and attribution
  - Stand segmentation and attributes evaluation
  - Especially for huge amounts of data and large areas
- Data management
  - GML-based data standards (ForestGML)
  - Methods for data exchange and management
- Forest inventory
  - Integrated methods and tools for semiautomatic forest inventory
  - Especially on stand level, but also on sample plot and single tree level

➔ Integrating the human into semiautomatic data acquisition processes
  - E.g., efficient tools to manually refine (on-site) results from remote sensing data processing to highly qualitative forest inventory data
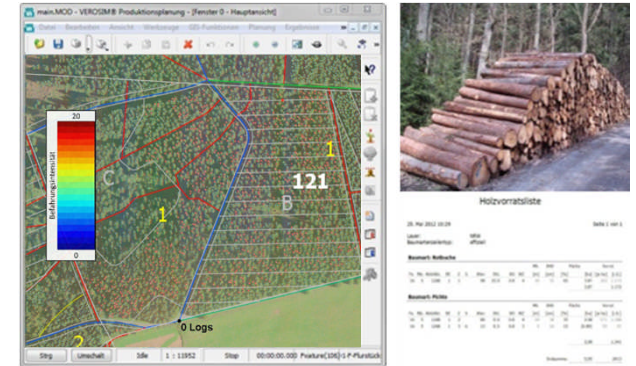

Remote Sensing Data Processing

Forest Inventory

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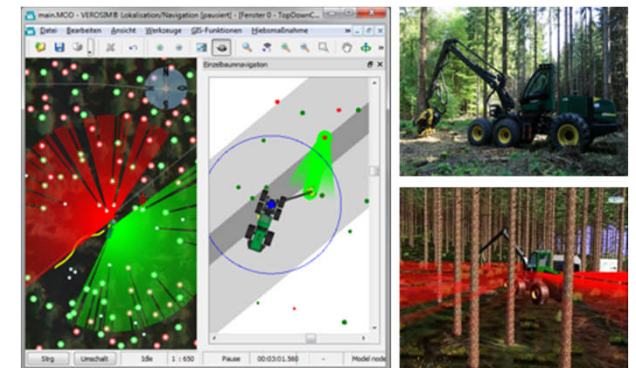## Expertise: Modeling, systems integration & simulation

- Forest machine simulation
  - Simulation-based development, e.g., of novel localization approaches
  - Training the use of forest machines
- Harvesting planning & cost estimation
  - Simulation-based, efficient planning of harvesting measures
- Terrestrial Sensors
  - Precise localization
  - Map building and refinement
- Harvesting assistance systems
  - Assistance systems to efficiently perform harvesting measures
  - Automation of harvesting processes

➜ Process integration
  - Integration of different processes along the value added chain
  - Use and update inventory and other data along the value added chain

Harvesting Cost Simulation

Harvesting Assistance System

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Current and previous work

- Research project series "Virtual Forest" I-III (2005-2014)
  - Setup, maintenance and usage of a shared virtual forest model
  - Integrated approach for forest inventory, management, simulation and process optimization
- Research project "ClusterWIS" (2016-2019)
  - Sustainable feedstock management and efficient wood and biomass mobilization throughout the cluster forestry and wood
  - Development of a novel, decentralized infrastructure integrating new planning and consulting methods and interconnecting existing decentral work processes
- Research project "Virtual Classroom Harvesting" (2017)
  - Harvesting cost simulation as a novel learning system for training and qualification
- Initiative „Forestry und Wood 4.0" (since 2015)
  - Using "Industry 4.0" approaches to resolve the cluster forestry and wood's structural problems
- FORD (2017-2018)
  - Simulation-based forest management to support complex decision-making processes with regard to sustainable forest development
- Development projects „GRIPS-FE RLP" (2014-2017) und „KlimaWIS-FE RLP" (2015-2018)
  - Transferring results from the "Virtual Forest" into practice at two German forest administrations