



NFA

Digital Perception Technology Enabling Future Forestry

Quality and Productivity Problems in Forestry

Unmet Specifications in Thinning Operations

4/5

Thinnings not performed in accordance with recommendations (Finland)

-15%

Overall loss in growth due to too sparse forests (Finland)

Untapped Potential for increased carbon capture

15-20

Million tonnes CO₂
Yearly potential with correct thinnings, half of total CO₂ emissions (Sweden)

Biodiversity: Increasing demand for alternative forest management strategies

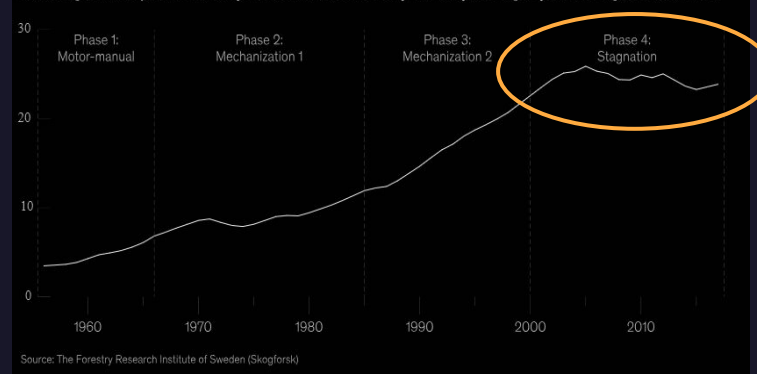
Increasing demand from private forest owners

Increasing pressure from regulatory/certification agencies (e.g. FSC 5% continuous cover)

Few subcontractors willing to take on assignments due to increased complexity and cost

Stagnated productivity development

Standing volume per worker day in the Swedish forestry industry, rolling 3-year average, cubic meters



Lack of skilled personnel

Unique combination required of operating the **machine** and making **forest** management decisions

High pace/constantly high cognitive load

The job no one wants: why won't young people work in logging?

NZ forestry industry cries out for young workers

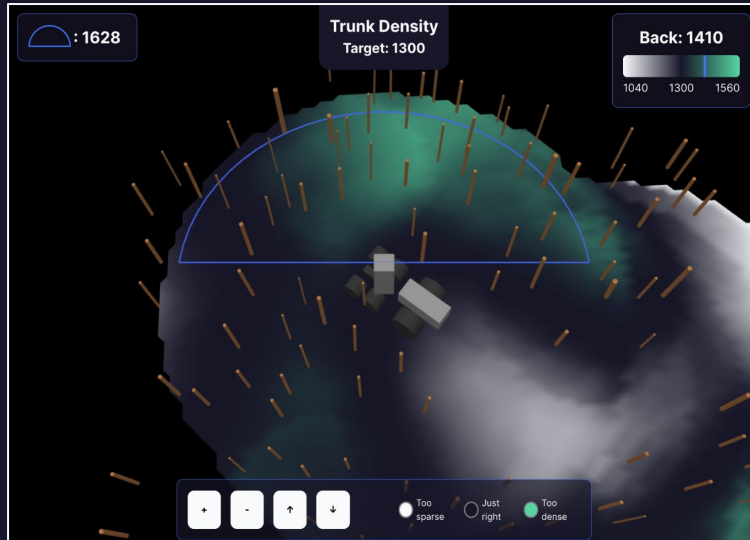
Bristen gör det svårt att växa

A shortage of workers in the forest industry?

Skriande brist på utbildade skogsmaskinförare

NFA's approach: AI-powered operator support systems

- Enable every operator to realize any forest management strategy efficiently
- Data collection for transparency and quality assurance
- 2 hour field retrofit on any machine



Green:
Above target
(Cut more)

Current
Target

Black:
On target



Harvester head
tracking

Lane distance
& width support



Progress

- 3,000+ hours operating time
- Testing: 8 machines, from 4 different manufacturers (including most common models)
- Permanent installations:
 - Now: 6 (5 in Swe, 1 in Australia)
 - End of year: 10-12
- Production start: 2025



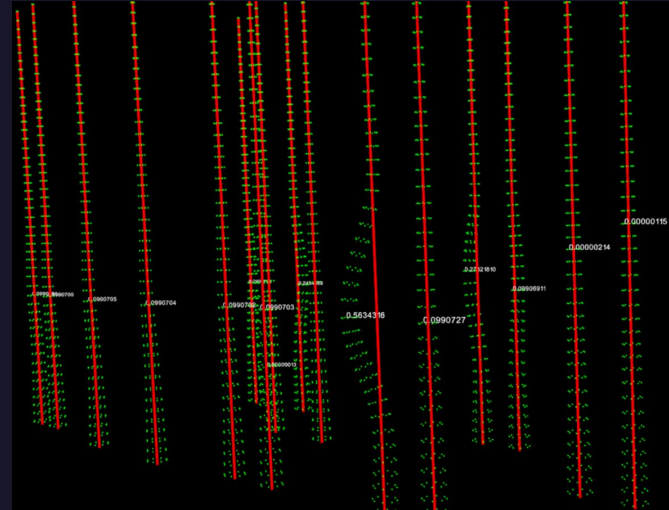
Project 1: Tree shape estimation

Background: Bucking (the process of dividing a tree trunk into logs) of irregularly shaped trees is done manually by the operator. Errors (bendy logs) causes problems at the sawmill, financial loss for the forest owner and suboptimal utilization of the felled tree.

Goal: Prototype and evaluate functionality to use onboard sensors (lidar/camera) to estimate the shape of standing trees, as a basis for operator support and automatic bucking.

Scope:

- Use NFA's synthetic data generation platform based on Nvidia omniverse to generate synthetic datasets, augmented with real-world data.
- Develop a tree shape estimation pipeline:
Input: point clusters corresponding to individual trees
Output: A parametric tree shape
- Evaluate performance on synthetic/real test data



Paper: <https://www.mdpi.com/1999-4907/15/5/818>

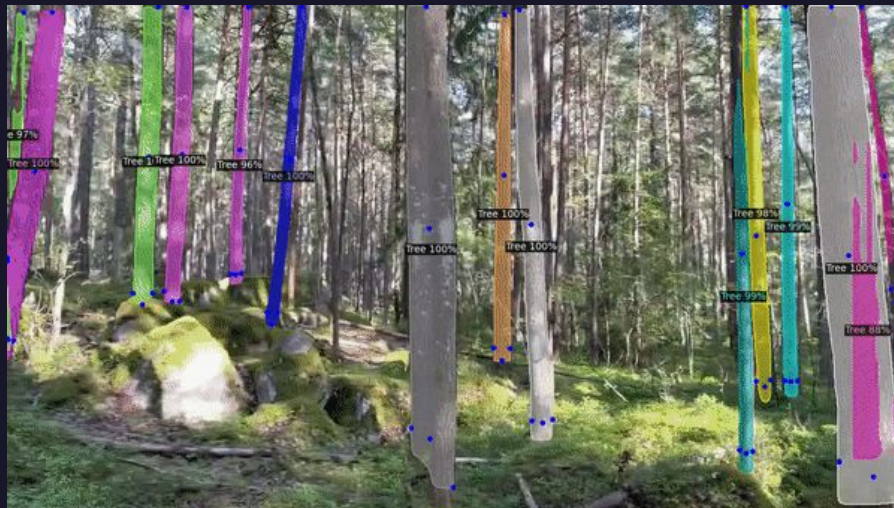
Project 2: Tree Instance Segmentation and Classification

Background: In certain harvesting forms there is a target in terms of tree species distribution after thinning. In order to build operator support functionality in this regard, the system should automatically classify each individual tree. In addition, instance segmentation masks may provide additional information on tree shape.

Goal: Evaluate instance segmentation and classification as a component in sensor based operator support system

Candidate Topics:

- Development of instance segmentation pipeline (including classification) on RGB data (synthetic and fleet data)
- Species classification (only) from fleet data
- Dataset augmentation using foundation models (e.g. <https://github.com/facebookresearch/sam2>)
- Deployment on embedded hardware (Nvidia Jetson) and evaluate real-time performance



Paper: <https://arxiv.org/abs/2210.17424>

Dataset: <https://github.com/norlab-ulaval/PercepTreeV1>

NFA Team - 50% PhDs in AI/Computer Vision



Lars Svensson CEO

PhD Robotics, perception and control of autonomous cars/trucks and forestry machines. Forest owner.



David Gillsjö CTO

PhD Computer vision and machine perception. 5 years experience from industrial software development.



Anton Rumberg CFO

MSc Finance, 8 years experience from business development and sales in the PE and VC industry (EQT). Forest Owner.



Martin Ahrnbom

PhD Computer vision and machine perception, software developer having worked on perception for traffic safety both in academia and industry.



Christina Westermark

MSc in vehicle engineering, AI and data specialist, 5 years experience working on autonomous cars at Volvo Cars.



Andrew Creekmore

BSc computer science, 4 years experience in software development and data modelling in the US government consulting industry, now specializing in web development and data infrastructure.



Strong emphasis on AI/software

Out of 6 total headcount 5 are software engineers, 3 of which hold PhDs in AI/Robotics/Computer Vision.

Contact Details & Further information

Lars Svensson CEO: +4673 460 68 34, lars@nordicforestryautomation.com

Anton Rumberg CFO: +4670 880 04 54, anton@nordicforestryautomation.com

Website: <https://www.nordicforestryautomation.com/>

Linkedin Page: <https://se.linkedin.com/company/nordic-forestry-automation>

Podcasts:

Skogsforum podcast: <https://open.spotify.com/episode/0ZIkqY1QEKMNUJnivi9zU>

Mistra Digital Forest: <https://www.mistradigitalforest.se/nyheter/nytt-poddavsnitt-ute-av-den-digitala-skogen-skog-och-data-fran-insamling-till-insikt/>

Södra podcast: <https://open.spotify.com/episode/4sv3uieqKqkLXGTImjQsb4>

News articles:

Demo day press release: <https://www.nordicforestryautomation.com/news>

Breakit: <https://www.breakit.se/artikel/37196/skogsjattarna-satsar-miljoner-pa-norcid-forestry-automation>

ATL: <https://www.atl.nu/skogsforetag-investerar-i-techbolag-for-gallringsstod>

Ny Teknik: <https://www.nyteknik.se/innovation/svensk-startup-ska-ge-skogsbranschen-forarstod-med-lidar-ligger-efter/3927544>