Advanced Virtual Aptitude and Training Application in Real Time (AVATAR)

Stakeholder-oriented article WP 3

Real time follow-up of the precision of the harvesters' diameter sensing

Sawmills are increasingly tailoring production to customer requirements, so it is important that harvesters can produce logs with the right properties, in specified dimensions and with minimal waste. Accurate dimension measurements in harvesters are vital for the forestry industries' capability to deliver wood according to sawmill orders, and indirectly for the forest owners' profit.

Skogforsk has recently developed a model that, for each harvested stem, predicts the measurement precision of the harvesters' diameter sensing. The prediction is based on an analysis of the occurrence of "flat areas" in the harvesters' own measurement data i.e., data that are registered in the standardized production messages of the harvesters. The model enables a direct and continuous feedback of the precision of the harvesters' diameter sensing to the operator and other users of the production data. Information that can be used for various follow-up purposes.

Within the Avatar project, the model was implemented in a prototype software and tested on 14 production harvesters together with Vida, the largest sawmill company in Sweden. The 14 harvesters were continuously followed for one year and the result of the follow-up can be summarized as follows:

- There was a high agreement between diameter measurement precision estimated by the model and corresponding precision estimated from the operators' control measurements (using caliper).
- During the test period the model was helpful in giving a rapid detection of technical errors on the diameter measurement equipment on two of the harvesters.
- The model has also shown to be effective in detecting operator effects on diameter measurement precision as well as the effect different types of forest have on the corresponding precision.
- Based on the result of the model one harvester head manufacturer has undertaken reconstruction of their harvester head.

In summary, the study shows that the model can be useful in different follow-up situations. The next step is to implement the model in suitable feedback systems.

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