

Traceability of logs with digital image processing

Johann Charwat¹, Alexander Petutschnigg² and Karl Entacher²

¹ Holzforschung Austria, Franz Grill Straße-7, 1030 Wien, Austria

² University of Applied Sciences Salzburg, Markt 136a, 5431 Kuchl, Austria

In the Austrian law (Forstgesetz 1975¹) it is defined that the utilization of forests has to be done according to the principle of sustainability. Traceability of logs is an important issue in European forestry (compare Korten 2007²) and methods to achieve an exact identification are needed.

In this paper a preliminary study is drawn to analyse if standard photography can be used for traceability. Eventually it is possible to get an image of a cross cut of the log in the forest and identify the log based on this image in the sawmill. Therefore a log was cut into 36 slices and images were taken.

The collected images were analysed and two main questions were asked:

Is the quality of the images useful for analysis and which circumstances have to be taken into account when collecting such images?

Is it possible to detect the annual rings and the shape of the log based on these images? This is important if algorithms to analyse fingerprints should be applied.

The results showed, that there has to be done a lot of work concerning data collection. E.g. the smoothness of the cuts of the chain saw (see fig. 1), debris from the chain saw (in our case the debris was frozen while cutting on the surface of the cut especially in the sapwood) the background (the contrast between log cut and surrounding) and other factors influenced the image quality substantially. Based on the collected images the shape of the log, the sap and heartwood, the annual rings could be detected. Nevertheless the appearance of log cuts is very different depending on the cut position. The results of this study do not lead to a clear estimation if this direction of research will be successful in the future or not. The findings are encouraging to make further studies with application on forest- and sawmill machinery. The most important result of this study was the fact one has to be aware of the difficulties and influences at data collection.

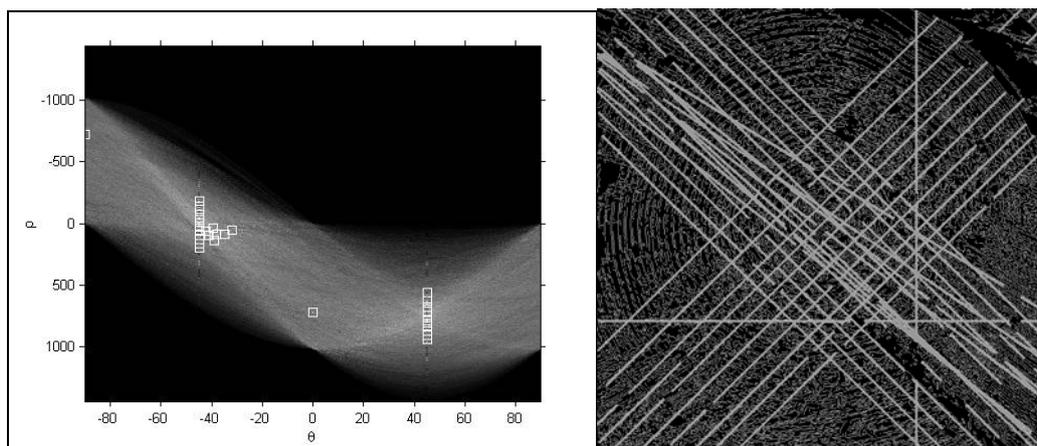


Figure 1 Detection of chainsaw cuts by Hough transform

¹ Österreichisches Forstgesetz 1975, aktuelle Fassung BGBl.I Nr. 55/2007

² Kaul, C., Korten, S. (2007): RFID in der Holzerntekette, AFZ-Der Wald, Ausgabe 2, S. 61