

# Artificial Intelligence Detects Illegally Imported Wood

Together with the Thünen Center of Competence for Timber Harvesting in Hamburg, we support customs authorities in detecting illegally imported timber. This is made possible by our AI-based analysis software, which we design and further develop in the “Image Processing” department.

Anyone importing a wood product into the EU must prove with a certificate that the wood does not come from illegal logging. In addition, customs authorities randomly inspect imported furniture and veneers as well as paper and fiberboard. The Thünen Institute for Wood Research in Hamburg often serves as the analysis expert for industry and authorities. „These checks have already led to a number of fine guitars being confiscated prior to an international music fair because their bodies were made of illegally harvested woods,” describes project manager Dr. Henrike Stephani the effectiveness of the authorities.

## From Mush to Tree

Especially for papers and fiberboards, not whole pieces of wood are examined, but their macerate. This is understood to be a pulp of crushed wood chips from which certain ingredients are

dissolved out with water or alcohol. The pulp is treated with various color solutions and applied to glass in a film only a few micrometers thick. This macerate film is so thin that individual vessels can be identified and classified. Up to now, employees of the Thünen Institute have done this by hand and visually. This procedure is time-consuming and sometimes error-prone, which is why the control is to be automated.

“This is where our algorithms come into play,” explains Stephani. Using reference specimen that the Thünen Institute produces from its huge wood inventory and makes available as high-resolution microscope images, the researchers train neural networks. Ultimately, the goal is to succeed in uniquely identifying wood. “At the moment, we are only dealing with hardwoods, because here every tree species has unique markers.” The goal of the project, however, is a database of all common wood species.



*Fiber analysis of a eucalyptus from the Thünen Institute for Wood Research*

## The Thünen Institute

The Thünen Institute is subordinate to the Federal Ministry of Food and Agriculture (BMEL) and conducts interdisciplinary research aimed at the sustainable development of rural areas, agriculture, forestry and the timber industry, as well as fisheries. It takes socio-economic, ecological and technological aspects into account. As a departmental research institution, the institute develops scientific foundations as a decision-making aid for the federal government’s policy. [www.thuenen.de](http://www.thuenen.de)

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