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# XyloTron

**XyloTron** is an open-source, portable wood identification system<sup>[1][2]</sup> developed to support the enforcement of laws against illegal logging.<sup>[3]</sup> The device uses machine vision and artificial intelligence (AI) to classify wood specimens based on their macroscopic anatomical features.<sup>[4][5]</sup><sup>[6]</sup>

Designed for use in both laboratory and field settings, the system provides a non-destructive method of wood species identification.<sup>[7][8][9]</sup> The system's accuracy depends on the quality of the training data and the similarity of samples to those included in the model. For high-stakes legal enforcement or forensic confirmation, microscopic analysis by a wood anatomist may still be required.<sup>[10]</sup>

## Overview

The XyloTron system was developed at the United States Forest Products Laboratory (FPL) in Madison, Wisconsin. Initial conceptual work began around 2018 under the direction of wood anatomist Dr. Alex Wiedenhoeft and his colleagues, with subsequent contributions from computer vision researchers including Dr. Prabu Ravindran.<sup>[11][12]</sup>

Unlike traditional wood identification techniques that rely on microscopic analysis by trained experts, the XyloTron uses image-based classification. It captures standardized images of a wood surface using a digital camera and controlled lighting, then compares the sample against a model trained on verified reference specimens. The system's hardware and software are open-source. Models used by the XyloTron are trained using labeled image datasets of known wood species, typically derived from museum-quality reference collections.<sup>[13]</sup>

Because it is designed to work offline, the XyloTron can be deployed in remote field locations without internet access.<sup>[14]</sup> Field trials in South America, Southeast Asia, and Africa have demonstrated the system's utility in intercepting timber suspected to be harvested illegally.<sup>[15]</sup>

## See also

- Illegal logging
- Wood anatomy
- Forest governance
- Timber mafia

## References

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## External links

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- Website (<https://xylotron.org/>)
  - Video demonstration of the XyloTron (<https://www.youtube.com/watch?v=xl8ambb7kL8>)
  - Global Timber Tracking Network (<https://globaltimbertrackingnetwork.org>)
  - European Commission page on illegal logging ([https://ec.europa.eu/environment/forests/illegal\\_logging.htm](https://ec.europa.eu/environment/forests/illegal_logging.htm)), with links to FLEGT Regulation (adopted in 2005) and EU Timber Regulation (adopted in 2010)
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