



Title: Enhancing Wood Log Traceability Through Biometric Features

Name: Phuc Ngo

Colaborateurs : Fleur Longuetaud, Frédéric Mothe, Dorian Martinetto et Georg Wimmer
Université de Lorraine, CNRS, LORIA, F-54000, Nancy, France

Log traceability is important for plant biosecurity because it helps track where logs come from and how they are handled. This helps prevent the spread of harmful insects, diseases, or pests that can travel with wood. By knowing the origin and type of wood, countries can better protect their forests and plants. Traceability also helps follow rules for safe trade and can stop illegal logging, which can damage the environment and plant health. In this context, physical traceability systems like plastic tags (barcode, QR code, number) or RFID chips are widely used. However, they are unreliable, can be fall out during forestry operations or during transport, and can be easily falsified. Thus, there is a need to develop new methods that are technically and economically realistic.

The present work uses recent advances in image processing and deep-learning techniques to enable biometric traceability of logs, based on visible features in in photos of their cross-section. More precisely, we proposed a new method consisting of two steps : (1) extracting visible features from log-end images, and (2) using the extracted features to verify whether two images correspond to the same log. The proposed method was compared with recent state-of-the-art methods and on two datasets, including a new and large dataset of almost 25k images. The results show the performance of the new method for identifying oak logs, significantly outperforming the most recent ones.

Biography

Phuc Ngo received an MSc in Computer Science from Aix-Marseille University in 2010, followed by a PhD from Paris-Est University in 2013. In 2014, she completed a postdoctoral fellowship at CEA before earning her Habilitation from Lorraine University in 2022. She is currently associate professor at Lorraine University. Her research focuses on digital geometry and topology, with a particular emphasis on geometric transformations, image processing and analysis, and their applications in wood image analysis.

Presenting author details

Full name: Phuc Ngo

Contact number: +33 677248480

Twitter account: //

Linked In account: //

Session name/ number: Plant Bio-security and Risk Analysis

Category: Oral presentation