Scientific information repository assisting reflectance spectrometry in legal medicine

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Reflectance spectrometry is a fast and reliable method for the characterization of human skin if the spectra are analyzed with respect to a physical model describing the optical properties of human skin. For a field study performed at the Institute of Legal Medicine and the Freiburg Materials Research Center of the University of Freiburg, a scientific information repository has been developed, which is a variant of an electronic laboratory notebook and assists in the acquisition, management, and high-throughput analysis of reflectance spectra in heterogeneous research environments. At the core of the repository is a database management system hosting the master data. It is filled with primary data via a graphical user interface (GUI) programmed in Java, which also enables the user to browse the database and access the results of data analysis. The latter is carried out via Matlab, Python, and C programs, which retrieve the primary data from the scientific information repository, perform the analysis, and store the results in the database for further usage.

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