



PURELY CHARACTERISTIC:

APPARATUS AND METHODS FOR OPTICAL BIOPSY AND MATERIAL CHARACTERIZATION THROUGH REFLECTANCE IMAGING

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Knowing the make-up of certain materials can yield certain advantages, such as knowing what is in airplane engine oil – especially if you're in charge of maintaining the craft and ensuring its safe operation. Characterization of many natural and artificial materials such as milk, paint, polluted air/water, most plastics, and biological tissues is difficult because these materials are turbid, or thick and opaque. Light scatters significantly in these materials. To date, no effective methods/techniques exist to interpret the measured scattered light signals such materials give off.

Dr. Xin-Hua Hu has developed an apparatus that collects the reflected and scattered light and uses Monte Carlo analysis to interpret the collected images. The resulting data can be used to determine characteristics of the observed material. The potential applications for Hu's technology are numerous and can give researchers and users a distinct advantage of knowing precisely what is in specific materials whose pure quality we depend on – like engine oil!

Potential applications for this technology:

- Optical biopsies of human tissue
 - The technology may better differentiate between normal moles and cancerous growths due to its ability to better determine the thickness of the skin irregularity.
- Quality control testing
 - Food products
 - Manufacturing of turbid fluids
 - Plastics manufacturing
- Inspection of materials such as motor oils for preventive maintenance of engines/motors
- Air and water quality inspection