The CUNY Center for Advanced Technology In Photonics Applications (CUNY CAT)
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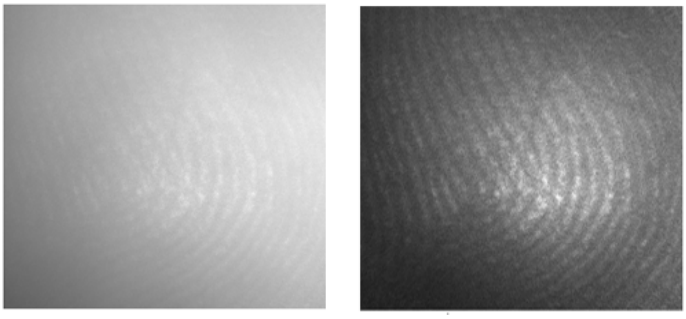
Surface Imaging and Fingerprint Security

Improvement in image contrast arising from the surface of a scattering medium, such as human tissue, can be achieved using polarization difference imaging and polarized light illumination. The image quality of the papillary ridges on the tips of fingers and thumbs (fingerprint) can be improved using any illuminating light.



Images of fingerprint with and without polarization

Applications:

- Personal identification with optical fingerprint scanners
- Medical imaging
- Real time surface imaging of scattering media

Benefits:

- Surface image information obtained from a simple
- Subtraction image component
- Image contrast is improved to enhance accuracy in optical fingerprinting
- Technique is simple and easily adaptable to existing imaging devices

The Technology:

When a scattering medium, such as tissue, is illuminated with polarized light, the image obtained in the backscattering direction contains two components: (1) a polarized component formed by photons that did not lose their polarization information (minimal scattering), and (2) the depolarized component formed by photons experiencing multiple scattering. The first component predominantly contains surface image information while the second, which is equally distributed in both polarization directions, contains subsurface image information. Subtraction of the perpendicular from the parallel image component leads to a new 'image' with enhanced contrast of surface structures, since the depolarized component is removed. This method can be used for optical fingerprint scanners. Optical fingerprinting for personal identification, can replace many existing and less reliable methods. Improving image contrast reduces false readings.

This technology opportunity sheet describes continuing efforts in this area. Several patents may have been issued or are pending and which may be available for licensing.

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