distinguishes this technique and makes it ideal for microscopic positioning of biopsy needles.

The computer-aided detection of these data was performed after the intraoperative acquisition, but real-time analysis is possible with simple system upgrades. A standard personal computer (3.2 GHz Pentium® D processor, 2.0 GB RAM) can analyze the axial-scan data at a rate of over 60 axial scans per second. This processing rate, combined with the speed of the OCT imaging system, which can acquire 5,000 axial scans per second, makes real-time tissue analysis with this device a straightforward prospect.

We have demonstrated that a needle device with an integrated fiber optic probe and associated computer-aided detection algorithms can be used to accurately identify breast lesions under intraoperative protocols that mimic the guidance of needle biopsies. The device is designed to be easily integrated into a commercial 20 gauge core needle biopsy device for clinical use. Integration of this probe into breast biopsy procedures promises to reduce non-diagnostic sampling rates by sensing the microscopic properties of the *in situ* tissue before removal.

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