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## Implementation of a High-Speed FPGA and DSP Based FFT Processor for Improving Strain Demodulation Performance in a Fiber-Optic-Based Sensing System

By Douglas L Farley

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book \*\*\*\*\* Print on Demand \*\*\*\*\*.NASA's Aviation Safety and Security Program is pursuing research in on-board Structural Health Management (SHM) technologies for purposes of reducing or eliminating aircraft accidents due to system and component failures. Under this program, NASA Langley Research Center (LaRC) is developing a strain-based structural health-monitoring concept that incorporates a fiber optic-based measuring system for acquiring strain values. This fiber optic-based measuring system provides for the distribution of thousands of strain sensors embedded in a network of fiber optic cables. The resolution of strain value at each discrete sensor point requires a computationally demanding data reduction software process that, when hosted on a conventional processor, is not suitable for near real-time measurement. This report describes the development and integration of an alternative computing environment using dedicated computing hardware for performing the data reduction. Performance comparison between the existing and the hardware-based system is presented.



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