

Nattapong Siansawasdi 2006: Fingerprint Verification Hardware Prototype Using Digital Signal Processor. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Vutipong Areekul, Ph.D. 187 pages.
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Although imported biometric products, especially automatic fingerprint identification system (AFIS), are widely known and used in Thai market nowadays, standalone fingerprint identification products are very expensive. Because of high computational complexity of fingerprint verification algorithm, a real-time fingerprint identification hardware needs to have a high performance processor with fast execution time. This challenging problem is a major drive to develop our Thai automatic fingerprint identification hardware prototype in order to improve our self-reliant electronic technology, and to reduce number of imported biometric products in the near future.

The fingerprint identification hardware prototype is designed under 4 constrains; i.e. small size, standalone fingerprint identification device, large memory for large fingerprint database, and peripheral interface flexibility. The selected digital signal processor (DSP) of this hardware prototype is Texas Instrument's TMS320C6713. Using DSP as the embedded processor can efficiently address all the processing needs. Moreover the selected DSP has easy-to-use tools and emulator for short-time software and hardware development.

This automatic fingerprint identification prototype system provides complete solutions for access control applications. User registration and administrator management can be easily done via personal computer or through hardware's keyboard and display. System can be extended for multi remote access units in large-scale office or building with LAN network connection. Finally, this hardware prototype performance achieves approximately 2-second average time for one-by-one fingerprint matching.



Student's signature



Thesis Advisor's signature

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