



Digital Signal Processing is a technique that converts signals from real world sources (usually in analog form) into digital data that can then be analyzed. Analysis is performed in digital form because once a signal has been reduced to numbers; its components can be isolated, analyzed and rearranged more easily than in analog form. Eventually, when the DSP has finished its work, the digital data can be turned back into an analog signal, with improved quality. For example, a DSP can filter noise from a signal, remove interference, amplify frequencies and suppress others, encrypt information, or analyze a complex waveform into its spectral components.

DSP Lab 1.0 is an integrated solution for establishing DSP based Embedded System Lab, based on TI 6000 platform. Basically the lab is designed to learn about the signal processing in Digital Domain. DSP Lab is equipped with complete set of Hardware and Software to perform DSP experiments. The approach enables the understanding of real-time DSP systems principles and realworld applications using, C and various assembly programs based on TI's TMS320C6713 Processor. The processing power of the integrated 'C6713 (floating point) DSP allow real-time processing of high bandwidth data streams thereby reducing the processing load placed on the host CPU.

#### DSP Lab Contents

##### Tutors

#### LAB programming tutor for TI 6000 DSP

Specially developed tutor to support lab activity using DSP kit and CCS.

#### Development Tools

Code Composer Studio Platinum Edition V3.1

Supporting all TIDSP platforms.

#### DSK6713

DSP starter kit for Texas Instrument's TMS320C6713 DSP

#### Documentation

##### Installation workbook

The procedure to install code composer studio and DSP Lab 1.0

#### Technical Specifications DSK 6713

- **TMS320C6713 DSK** : TMS320C6713 DSK development board
- **Other hardware** : External 5 V DC power supply IEEE 1284 compliant male-to female cable Hardware Lock
- **CD** : Code Composer Studio DSK tools, DSP Lab 1.0
- **Other Accessories** : Audio cables, Installation Manual, Experiments Work

- MATLAB 7.0.4 (Trial version for 30 days)
- Technical reference guide for TMS320C6713
- The C6713 DSK has a TMS320C6713 DSP onboard that allows fullspeed verification of code with Code Composer Studio. The C6713 DSK provides :
  - A USB Interface
  - SDRAM and ROM
  - An analog interface circuit for Data conversion (AIC)
  - An I/O port
  - Embedded JTAG emulation support

#### Code Composer Features Include :

- IDE
- Debug IDE
- Advanced watch windows
- Integrated editor
- File I/O, Prod Points, and graphical algorithm scope Prods
- Advanced graphical signal analysis
- Interactive profiling
- Automated testing and customization via scripting Visual project management system

#### Scope of Learning

- Sampling & Waveform Generation
- Quantization
- PCM Encoding
- Delta Modulation
- Digital Modulation Schemes (ASK, PSK, FSK)
- Error Correcting Codes
- Read Write from CODEC
- Fast Fourier Transform
- FIR Filter implementation (Low Pass, High Pass Band Stop)
- IIR Filter implementation
- Linear Convolution
- Auto Correlation
- Power Spectral Density



Note: Specifications are subject to change.

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