Teaching Digital Signal Processing on Smartphones: A Mobile DSP Laboratory

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Newly Introduced Teaching Paradigm

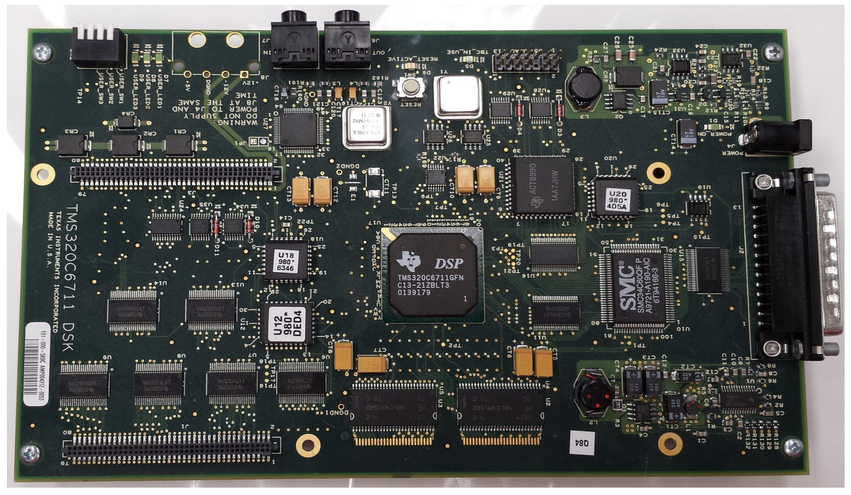
Applied or real-time digital signal processing courses offered at many universities have greatly enhanced students' learning of signal processing concepts by covering practical aspects of implementing signal processing algorithms.

Not only do there exist hardware and software costs associated with equipping a teaching laboratory with DSP or other implementation boards, in many cases these boards are confined to a specific teaching laboratory location. Taking advantage of the ubiquitous utilization of smartphones, we have developed a truly mobile and cost-free laboratory environment for teaching applied or real-time DSP courses by enabling students to use their own smartphones to implement digital signal processing algorithms.

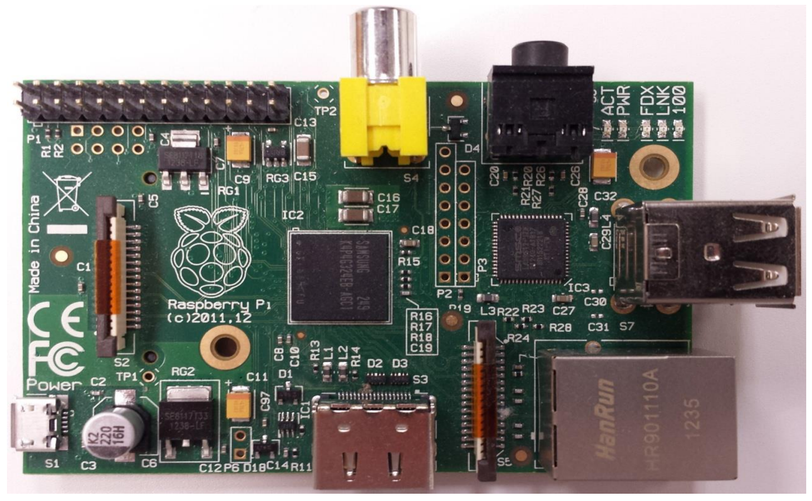
This alternative approach to what is currently being utilized (DSP boards, low-cost ARM-based boards) is developed in such a way that the programming requirement is no different than C programming that is familiar to signal processing students.

Download and run one of the labs as an app on your own Android smartphone:
http://www.utdallas.edu/~kehtar/AdaptiveFilter.apk

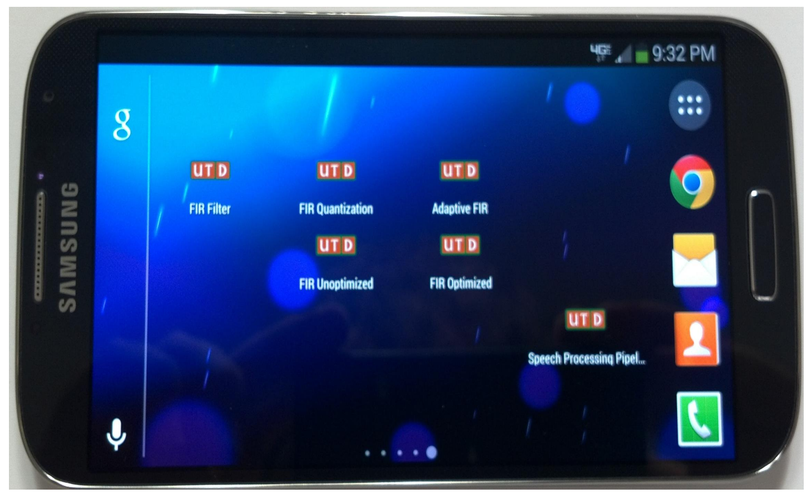
Smartphones: Mobile and Cost-Free Hardware Platform for Teaching Applied or Real-Time Digital Signal Processing Courses



TI DSP Board



ARM-based Raspberry Pi Board



Smartphone "Board"

Labs: FIR/IIR Filtering, Quantization Effect, Adaptive Filtering, Frequency Transform, C Code Optimization, Application Project