Workshop - Designing Signals and Systems Laboratories using Java-DSP

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Abstract - The participants of this workshop will be exposed to the utility of the Java-DSP education software in multidisciplinary signal and data analysis applications. The session will be interactive and participants will use and assess an exercise that involves step-by-step online simulations using Java-DSP. Examples of prepackaged online laboratory exercises generated in 2010 that can be disseminated in certain types of data related courses will also be presented. A newly developed interactive learning environment, involving online quiz synchronized with multiple Java-DSP simulations, will be of special interest to the participants. Apart from basic modules that will be useful for DSP courses, new modules in music and audio signal processing, wireless communications, and power systems will also be demonstrated. The workshop will be useful to instructors and practitioners with interests in signals and systems, DSP, data analysis for earth systems and geology, signal analysis for music courses and other applications.

Index Terms - DSP, Java, interactive simulations, online labs, signals and systems.

Workshop Activities and Objectives
This workshop will include tutorials and examples to demonstrate how instructors can use Java-DSP in their classes both as a demonstration tool and as a tool that enables them to provide multidisciplinary laboratory experiences to on-campus and distance learning students. The session will be conducted as a computer workshop and participants will program, and execute Java-DSP-based exercises and scripts. The objectives are:

- to learn how to use Java-DSP. Documentation and instruction will be given to get participants started.
- to learn how to use the signal and data generator and the filter functions.
- Programming Java-DSP demos to help students understand linear system and filtering concepts.
- to learn how to use the FFT to compute spectra of signals.
- to learn how to use other pre-canned signal functions.
- to learn how to use Java-DSP scripts to embed demonstrations in web courses.
- to enable participants to design their own Java-DSP laboratory exercises.
- to demonstrate to the participants how to carry an assessment of their exercises.
- to learn how to use the online Java-DSP quiz.

Audience
The workshop is intended for Electrical Engineering, Computer Science, Geology and Earth Systems, and other engineering faculty and instructors teaching courses that involve signal and data analysis.

Expected Outcome
Participants will be able to use the Java-DSP software and laboratories, design their own Java-DSP based laboratories and exercises, and form and execute an effective evaluation plan of these exercises. Participants will be able to plan an adaptation of these practices and materials to their courses.

List of Equipments
We will need a projector and the participants are strongly encouraged to bring their own laptops at the workshop. We will also bring a couple of extra laptops for the use by participants.

Acknowledgement
The project is being funded by the NSF CCLI Phase 3 program. Java-DSP has been a finalist for the PREMIERE NEEDS award and was recognized as such in the 2003 FIE conference in Denver. Previous publications describing Java-DSP functions and assessment are listed [1-19].

References


**Session W3B**

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