Ham Friendly Digital Signal Processing (DSP) using GNU Radio Companion (GRC)

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GNURadio

THE FREE & OPEN SOFTWARE RADIO ECOSYSTEM

Audience Survey

- Who has experience with Software Defined Radio (SDR) projects?
- How many are familiar with Digital Signal Processing (DSP)?
- How many are familiar with GNU Radio Companion (GRC)?

Digital Signal Processing and the Ham

Where does DSP fit into the world of SDR?

How can I develop my own DSP applications?

Where does DSP fit into the world of SDR?

Why Should I Learn More about DSP?

- The 'radio' in “SDR” is the DSP software
- DSP is that part of the SDR that the home experimenter can build
  - Contemporary SDR 'front ends' are almost impossible for the home experimenter to build – miniaturized surface mount technology and multilayer PCB's

How can I develop my own DSP applications?

'Ham Friendly' DSP

- Innovative and accessible graphical DSP software: GRC, MATLAB, LabView
- 'Beginner friendly' DSP text books, on-line tutorials and support
- DSP software authoring is within reach of any curious ham

GNU Radio DSP Library

GNU Radio is an *Open Source DSP* library written in C++ to maximize computation speed and efficiency, with a Python shell

GNU Radio Companion (GRC)

GNU Radio Companion (GRC) is the graphical user overlay *on top* of GNU Radio. GRC permits visualization and manipulation of the DSP functions (aka. algorithms) without learning a programming language

GNU Radio Companion (GRC)

- GRC is designed for hands on, trial and error experimentation with DSP
- Make a mistake? Change an algorithm or a parameter in real time
- Adjust parameters while operating the GRC DSP–enabled SDR

GRC Demonstration

- Main screen, work space, DSP library
- Move and link DSP graphical blocks, execute a DSP program
- Implementation of:
  - Filter
  - Mixer
  - Amplifier
- SDR flow graph and demonstration

www.w7fu.com

Installation and Maintenance of GRC

'Step by Step'

SDR flow graph applications

available for download

DSP Bibliography and Tutorial links