Peidong Qi
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RTL SDR to Raspberry Pi Connection and Datalogging

Goals

Get familiar with GNURadio. Study the software design for the RTL SDR coherent direction finding.

General approach

Since we are going to use the SDR card from the coherent-receiver company, it is import for us to understand the hardware and software design of the product we are going to use. This week, I did some research about the coherent direction finding project. I mainly focus on the software design.
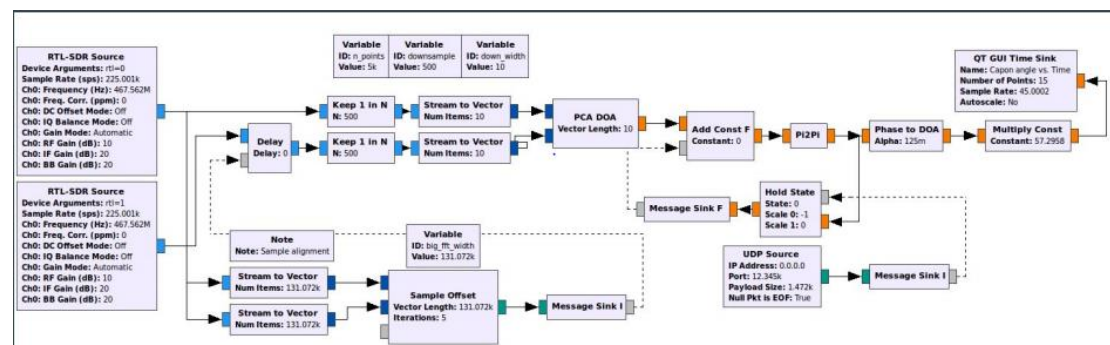
This figure is the flowgraph they have build in the GRC. Most likely we can use it for our project design. We need to go the code level for those blocks and figure out how to build those blocks in GRC. The coherent-receiver company already release the code in github[7].

..		
CMakeLists.txt	added hold state block	a year ago
add_const_ff.h	added 'add constant' float block with message control	a year ago
api.h	added gnuradio oot module with capon_ccf block	a year ago
capon_ccf.h	added gnuradio oot module with capon_ccf block	a year ago
cub_delay_cc.h	added cub_delay_cc block	a year ago
cumulative_ff.h	added cumulative sum block	a year ago
delay.h	added stock delay files (oops)	a year ago
full_capon3_ccf.h	added capon block for 3 antennas, not yet functioning	a year ago
full_capon_ccf.h	added full capon block, needs further debugging	a year ago
hold_ff.h	added hold_ff block	a year ago
hold_ii.h	added hold_ii block and gave zero_pad a name	a year ago
hold_state_ff.h	added hold state block	a year ago
lin_delay_cc.h	added feedback capability for linear delay block	a year ago
linearslope_ff.h	added linearslope_ff block	a year ago
message_sink_f.h	added float message sink block	a year ago
message_sink_i.h	added message_sink_i	a year ago
mode_ii.h	added mode block	a year ago
multiply_exp_cc.h	added C++ multiply_exp block	a year ago
peak_estimator_cif.h	changed peak_estimator_cff to peak_estimator_cif	a year ago
phase2doa_ff.h	added phase to doa block	a year ago
pi2pi_ff.h	added pi2pi block and phase sub heir block	a year ago
sample_offset_cci.h	renamed sample_offset_ccf to sample_offset_cci	a year ago
unwrap_ff.h	added unwrap_ff block	a year ago
variance_ff.h	added variance block	a year ago
zero_pad_cc.h	trying to fix variance block	a year ago

I will keep working on those block header files. Once we got the SDR card, we can start to build our own blocks and flowgraph.

Planned Course of Action

Keep working on SDR, get SDR card as soon as possible and to do data transfer test on SDR.

Resources and relevant Forum Posts

[1] "RTL-SDR Blog silver dongle first impressions, compared to NooElec blue dongle"https://medium.com/@rxseger/rtl-sdr-blog-silver-dongle-first-impressions-compared-to-nooelec-blue-dongle-4053729ab8c7

[2] "VIDEO TUTORIAL: INSTALLING GQRX AND RTL-SDR ON A RASPBERRY PI"https://www.rtl-sdr.com/video-tutorial-installing-gqrx-and-rtl-sdr-on-a-raspberry-pi/

[3] "DIGITAL RADIO WITH A RASPBERRY PI" http://www.michaelcarden.net/?p=48

[4] "Guided Tutorial GNU Radio in Python "https://wiki.gnuradio.org/index.php/Guided_Tutorial_GNU_Radio_in_Python

[5] "GRCon17 - Real-Time Direction Finding Using Two Antennas on an Android Phone - Sam Whiting" https://www.youtube.com/watch?v=jptYYiHth8U

[6]" Real-Time Direction Finding Using Two Antennas on an Android Phone - Sam Whiting" https://www.gnuradio.org/wp-content/uploads/2017/12/Todd-Moon-Gnuradio-DOA.pdf

[7]"gnuradio-doa" https://github.com/samwhiting/gnuradio-doa/tree/master/flowgraphs