Data Processing School :: Exercise CR3

Source directory	/data/lofarschool/data/Exercise-CR1
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Context

Prerequisite

- Some C/C++ programming.
- Installed USG software (CR-Tools package)
- Successful completion of Exercise CR0

Description

Files & Directories

```
/data/lofarschool/data/Exercise-CR
`-- 2006.02.23.04:02:50.283.event
```

And the `exercise_cr3` executable.

Step-by-step instructions

1. Execute the `exercise_cr3` programm.
2. This processes one LOPES event in three different ways.
3. Play around with the parameters in the source and see what happens.

Example outputs

The unmodified programm produces the following output:

```
(horneffer)lioff024> ./exercise_cr3
  1) Testing on big LOPES30 event w/o direction-fit & w/o TV-Calib
FirstStagePipeline::setCalibration: Frequency band for analysis: 4.3e+07 Hz
to 7.4e+07 Hz.
SecondStagePipeline:: switched off phase calibration.
CRflaggingPlugin:calcWeights: Flagged Antenna #24 due to lack of signal.
Event "/data/lofarschool/data/Exercise-CR/2006.02.23.04:02:50.283.event" fit
results:
 Fit to X-Beam has converged:
  XHeight: 5.27036e-06 +/- 2.52093e-07
  XWidth : 4.91536e-08 +/- -1.11584e-09
  XCenter: -1.80235e-06 +/- -1.56835e-18
 Fit to CC-Beam has converged:
```

```
  CCHeight: 5.99877e-06 +/- 2.67481e-07
  CCWidth : 5.16044e-08 +/- -1.30126e-09
  CCCenter: -1.80272e-06 +/- -6.61175e-11
  2) Testing on big LOPES30 event with simplex-fit
FirstStagePipeline::setCalibration: Frequency band for analysis: 4.3e+07 Hz
to 7.4e+07 Hz.
TVCalibrationPlugin: Not trusting Ant: 27 with residual badness: 0.202548
TVCalibrationPlugin: Not trusting Ant: 28 with residual badness: 0.160514
CRflaggingPlugin:calcWeights: Flagged Antenna #24 due to lack of signal.
analyseLOPESevent::doPositionFitting: starting evaluateGrid().
analyseLOPESevent::doPositionFitting: starting SimplexFit().
 SimplexFit: reducing simplex
## 0 ------------------------------
  Azimuth:   275.13; 276.13; 275.13; 276.13
  Elevation:  53.32;  53.32;  54.32;  54.32
  Distance:  4000.0; 6000.0; 2000.0; 3000.0
  Center:    -1.807; -1.802; -1.792; -1.805
  Height:     4.862;  6.500;  2.583;  3.802
 SimplexFit: expanding simplex
## 1 ------------------------------
  Azimuth:   275.13; 276.13; 276.47; 276.13
  Elevation:  53.32;  53.32;  52.99;  54.32
  Distance:  4000.0; 6000.0; 6666.7; 3000.0
  Center:    -1.807; -1.802; -1.803; -1.805
  Height:     4.862;  6.500;  6.756;  3.802
.
.
.
 SimplexFit: reducing simplex
## 22 ------------------------------
  Azimuth:   276.40; 276.38; 276.41; 276.41
  Elevation:  53.08;  53.10;  53.08;  53.11
  Distance:  6455.1; 6354.7; 6389.3; 6460.6
  Center:    -1.803; -1.803; -1.803; -1.803
  Height:     6.807;  6.808;  6.807;  6.807
Event "/data/lofarschool/data/Exercise-CR/2006.02.23.04:02:50.283.event" fit
results:
 Fit to X-Beam has converged:
  XHeight: 6.47303e-06 +/- 1.67425e-07
  XWidth : 4.91414e-08 +/- -6.03305e-10
  XCenter: -1.80407e-06 +/- -4.69194e-19
 Fit to CC-Beam has converged:
  CCHeight: 6.80782e-06 +/- 1.94929e-07
  CCWidth : 5.27394e-08 +/- -8.45719e-10
  CCCenter: -1.80339e-06 +/- -4.33048e-11
  3) Testing on big LOPES30 event with simplex-fit and upsampling
FirstStagePipeline::setCalibration: Frequency band for analysis: 4.3e+07 Hz
to 7.4e+07 Hz.
TVCalibrationPlugin: Not trusting Ant: 27 with residual badness: 0.202548
TVCalibrationPlugin: Not trusting Ant: 28 with residual badness: 0.160514
```

```
CRflaggingPlugin:calcWeights: Flagged Antenna #24 due to lack of signal.
SecondStagePipeline:: switched off phase calibration.
SecondStagePipeline:: switched off RFI mitigation.
analyseLOPESevent::SetupEvent: Upsampling: upBlockSize: 2048 upBlock: 63
filter: 12
analyseLOPESevent::SetupEvent:  min(Times): -6.4 max(Times): -0.003125
analyseLOPESevent::doPositionFitting: starting evaluateGrid().
analyseLOPESevent::doPositionFitting: starting SimplexFit().
 SimplexFit: reducing simplex
## 0 ------------------------------
  Azimuth:   275.13; 276.13; 275.13; 276.13
  Elevation:  53.32;  53.32;  54.32;  54.32
  Distance:  4000.0; 6000.0; 2000.0; 3000.0
  Center:    -1.805; -1.806; -1.806; -1.803
  Height:     4.741;  5.727;  3.238;  3.580
 SimplexFit: expanding simplex
## 1 ------------------------------
  Azimuth:   275.13; 276.13; 276.47; 276.13
  Elevation:  53.32;  53.32;  52.99;  54.32
  Distance:  4000.0; 6000.0; 6666.7; 3000.0
  Center:    -1.805; -1.806; -1.806; -1.803
  Height:     4.741;  5.727;  6.119;  3.580
.
.
.

 SimplexFit: reducing simplex
## 24 ------------------------------
  Azimuth:   276.48; 276.50; 276.47; 276.47
  Elevation:  53.13;  53.14;  53.12;  53.14
  Distance:  6743.8; 6906.2; 6830.3; 6766.7
  Center:    -1.806; -1.806; -1.806; -1.806
  Height:     6.143;  6.140;  6.142;  6.142
Event "/data/lofarschool/data/Exercise-CR/2006.02.23.04:02:50.283.event" fit
results:
 Fit to X-Beam has converged:
  XHeight: 5.79741e-06 +/- 9.57315e-08
  XWidth : 4.97792e-08 +/- -1.93828e-10
  XCenter: -1.80605e-06 +/- -2.51624e-20
 Fit to CC-Beam has converged:
  CCHeight: 6.1423e-06 +/- 7.1493e-08
  CCWidth : 5.08279e-08 +/- -1.55455e-10
  CCCenter: -1.80587e-06 +/- -4.48362e-12
[2] Testing argumented constructor ...
Elapsed: 3:59.30 - CPU: 227.714u+7.468s = 98.2%
```

Bug Reports

If you are experiencing trouble getting the exercise to work, this is the place to leave a note about it.