

ScisoftPy – a NumPy-like package within GDA

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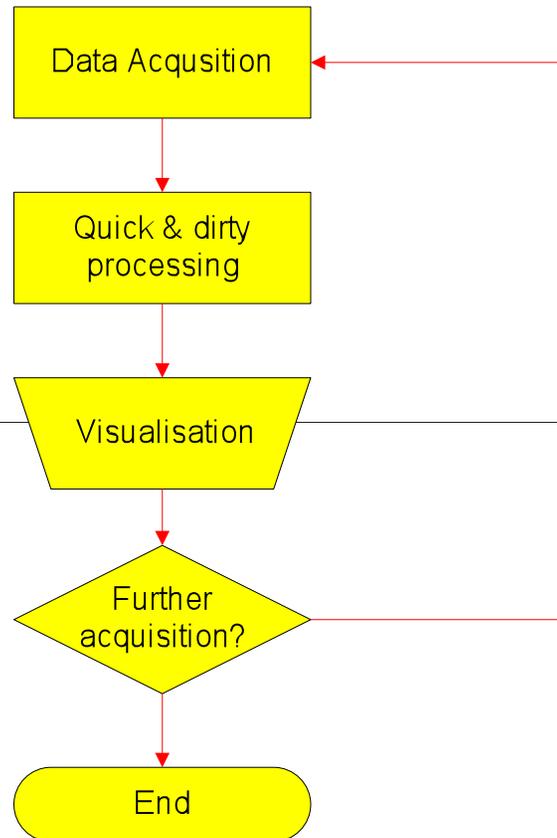


Contributors

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- Mark Basham
- Duncan Sneddon



Introduction: closely-coupled



Scisoft requirements

- Java based as required by GDA
- Easy scripting
- Bulk dataset objects as N-dimensional arrays
- Basic arithmetical operations
- Mathematical and statistical functions
- Curve fitting/regression
- Input/output to various data file formats
- Plotting scalar 1D, 2D and 3D data

NumPy inspiration

- NumPy – Python extension but C based
- Matplotlib – simple interface but poor 3D performance
- SciPy – built on NumPy with further scientific computing functionality



Implementation Details

- Java classes for many dataset types
- Clean separation
- Wrapped by Jython subclasses/functions



Package size

Java classes – 57000+ lines

Jython modules – 6800+ lines

Java/RCP plotting/GUI – 58000+ lines



Dependencies

CBFlib, NeXus, JTransforms, Commons-Math,
JAMA, vecmath

Eclipse RCP, JOGL, jReality



Demonstration of ScisoftPy



Summary and conclusion

ScisoftPy allows:

- Analysis of data
 - GUI interaction combining with analysis scripting
 - Can be combined with further data acquisition
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Further work:

- More coverage of NumPy's functions
- Add simplified NeXus interface