and also provides support for the extensive CCP4 monomer library through the *mmLib.Extensions.CCP4Library*. The naming of this class expresses the intention that other standard data sources should be made accessible in the same way.

The CCP4 monomer library is in fact included with the software as a directory tree of small files in mmCIF format, which are loaded into the *Structure* object through the normal use of the toolkit's mmCIF parser.

mmLib.GLViewer is a module provided to support visualization programs using the OpenGL graphics environment. Although it does not by itself provide a stand-alone viewer, it can be incorporated into many common graphics application building environments. An example molecular viewer, *mmView*, is provided with the distribution as an example of an application using the GTK graphical user interface, a popular toolkit in Linux.

5.3.9. Concluding remarks

CIF is a domain-specific format that cannot attract the number of programmers that generic formats such as XML do. In spite of this, there is an impressive collection of programs available to support activities at many levels, from the single-line shell script needed to search for some desired content in a collection of CIFs, to the industrial-scale activities of major databases and publishing houses. As many examples as possible of the programs discussed in this chapter have been collected on the IUCr web site (http://www.iucr.org/iucr-top/cif/software). It is hoped that the contributions described here will inspire future generations of programmers to contribute to a growing and increasingly robust software collection to make the use of CIFs ever easier and more fruitful.

I am immensely grateful for the assistance, cooperation and involvement of the community of software authors who have contributed to this chapter in one way or another, and to all the programmers and developers who have been active through the cif-developers discussion list of the IUCr (http://www.iucr.org/iucr-top/lists/cif-developers) and in private discussions.

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