abstracts, the system computes the words with the strongest relations with a set of categories, and then extracts keywords and computes their relationship to each other.

**ABView: HivResist**

ABView: HivResist is another method that focuses on a small set of the MEDLINE literature. It was originally developed to study HIV drug resistances and their associated mutations. Using such a focused set of literature reduces the ambiguity of terms.

For the future, nothing can substitute for a full-fledged text mining and data mining analysis of the medical literature. Such methods are, of course, the main topic of this book.

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**3D MEDICAL INFORMATICS**

**What Is 3D Informatics?**

Three-dimensional medical informatics is the application of data analysis to images, volume data, and other dimensional data in addition to text-based metadata associated with imaging. Medical storage repositories are filling rapidly with this type of information, e.g., nonprint data in the form of audio recordings, films of X-rays and 3D imaging, and video recordings. The tools to index all of these nontext medical information are somewhat rudimentary today, so more sophisticated/focused systems are needed; no doubt data and text mining will play an important part here. These types of data may include more than three dimensions; e.g., 3D informatics may also include things like position, time, scale, and also multichannel data rather than just one dependent dimension. Object recognition may be very important to 3D medical informatics; object recognition is discussed in Chapter 21 as one of the “developing new areas of data mining.”

**Listing of types of scans done in medicine:**

- X-rays (two-dimensional)
- CT scans—ray-computed tomography (three-dimensional)
- PET scans (3D)
- Magnetic Resonance Imaging (MRI)

All of these new three-dimensional scanning methods, with an increasing deluge of data, motivated the development of the following tools:

- An industry of Picture Archiving and Communications Systems (PACS)
- The creation of standards for Digital COmmunications in Medicine (DICOM)

Three-dimensional methods in medicine are not just in body imaging, as there is a relatively new area of “surgical templates,” e.g., 3D templates, created for each patient, an example being the screws that need to be put into a patient’s vertebrae in certain kinds of