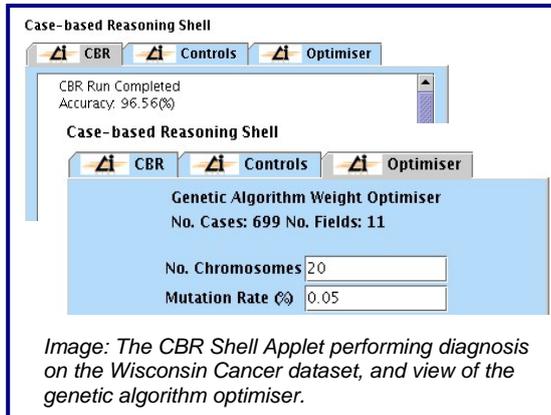




## Case-Based Reasoning for the Pharmaceutical Industry

...learning through experience



**Case-Based Reasoning (CBR) is one of the most successfully applied AI technologies of recent years. The Artificial Intelligence Applications Institute at the University of Edinburgh has developed a Case-Based Reasoning Shell whose design has been developed and refined over numerous commercial projects. As a result, CBR has been found to have specific applications in the pharmaceutical industry.**

Case-Based Reasoning is based on the intuition that new problems are often similar to previously encountered problems and, therefore, that past solutions may be of use in the current situation. Commercial and industrial applications can, therefore, be developed rapidly, and existing corporate databases can be used as knowledge sources.

CBR is particularly applicable to problems where the domain is not understood well enough for a robust statistical model or system of equations to be formulated. While the general case-based reasoning methodology can be applied across different application domains, the implementation of the case retrieval and similarity scoring functions is typically highly customised to the problem at hand.

AIAI's CBR Shell has an advanced performance optimisation module, based on a genetic algorithm, and both Java and C++ versions have been implemented.

### Key Benefits

- CBR is an efficient, robust and readily-understood technique for data analysis;
- CBR converts existing organisational resources into exploitable knowledge;
- CBR understands the underlying patterns and discovers the knowledge implicit in datasets that are critical to improving products and decreasing unnecessary investigations;
- Transforming data into useful knowledge is the unique strength of applied artificial intelligence techniques, such as CBR.

### Applications

- **Diagnosis/Treatment Decisions**  
– eg. determining whether or not cancer treatment is necessary, given a set of past cases;
- **Design Tasks**  
- in the planning of experiments and the design of manufacturing processes, as well as in the design of drugs themselves;
- **Medical Trials**  
– for the analysis of data from trials and high-throughput experimental processes;
- **Protein Structure Prediction**  
– prediction of structure in combination with other knowledge-based AI methods; and
- **Classification Tasks**  
- to determine a fault from observed attributes.

### Type of Collaboration Wanted

The University of Edinburgh is seeking suitable industrial partners for collaborations in the areas of development projects and licensing of core case-based reasoning engine technology.

### Further Information

For further information on this technology transfer opportunity with the University of Edinburgh, please contact:

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