

# Cyc Design Challenges and Solutions

Keith Goolsbey  
Cycorp Inc.  
3721 Executive Center Drive  
Suite 100, Austin, TX 78731

## **Abstract**

Cyc comprises a large, contextualized, common sense knowledge base (KB) which is encoded in an expressive representation language (essentially FOL with a few key extensions) and paired with an inference engine optimized for the classes of queries we most frequently encounter. These queries tend to mix relatively shallow reasoning within one of a large number of idiosyncratic subtheories with relatively deep reasoning within one of a very small number of stylized subtheories. The constraints of these queries in a large and expressive KB combined with the need to efficiently react to KB elaboration together provide a unique set of design challenges that are extremely stressful for the solutions provided by the current state of the art FOL theorem provers. The solutions to these challenges currently adopted by the Cyc inference engine will be presented within the context of a new suite of TPTP problems that are derived from Cyc's KB and typical queries and are intended to demonstrate Cyc's design challenges for investigation by the wider community.