

Expert systems in geotechnical engineering

The aim of expert systems is to facilitate the work of specialists in extremely various sectors. These new approaches are very promising in the domain of geotechnical engineering, where the engineer must often make decisions without the basis of any formal analytical models, but trusting only his personal experience and his intuition. This is especially the case for the choice of excavation methods and adequate supporting structures as, contrary to studies of stability or design calculations, no mathematical model adapted for such tasks exists (Figure 1).

The aim of the research programme is to explore different techniques to treat these aspects, such as artificial neurones, fuzzy logic and probabilistic approaches and to integrate them into expert systems based on rules taken from the literature and interviews with experts.

A first expert system to aid in the choice of an adequate supporting system for tunnels as a function of geological, hydrogeological and geotechnical conditions as well as the characteristics of the structure has been developed.

Publications

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- Dudt J-P. 1993. Géotechnique et intelligence artificielle. *IAS Ingénieurs et architectes suisses* : pp. 204-209; 374-379.

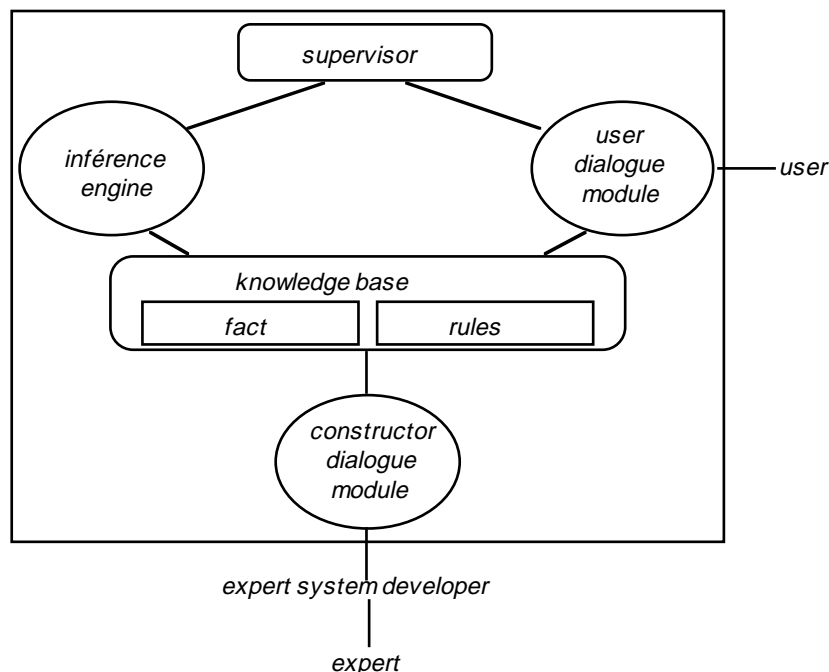


Figure 1: Diagram of an expert system