

Context

Knowledge Engineering, Visualization, GUI Development, Artificial Intelligence

Background

Nowadays in many research fields domain experts are facing an abundance of collected data. Although domain experts own the necessary knowledge to correctly interpret such large amount of data, often they don't have the right expertise to extract it and generate results. As a consequence they have to outsource this kind of work to a data mining or statistical expert, losing control and precision both in data selection and analysis, which are in large part based on the expert knowledge in the application domain.

TUM's Model-based Systems & Qualitative Reasoning group is currently engaged in developing a generic, constraint-based configuration system called GECKO. The project aim is to develop an application-independent software solution for solving user-focused configuration problems. The first application is a training planning tool. Such fitness tool produce a large amount of user data, which can be used to analyze the performance of the trainee, the effectiveness of the generated training plans, and to validate existing training knowledge. However, due to the amount of recorded data it is necessary to develop tools to automate certain steps in the data analysis process and to assist the domain experts. One very important aspect of data analysis is the visualization of knowledge structures and of the results of machine learning or data mining experiments. Therefore, MQM is planning to develop a software solution for knowledge visualization.

Task

The outcome of this thesis shall be a prototypical software solution for visualization of expert knowledge. In this study the represented knowledge will originate in the sport and training sciences. For the Thesis, the following tasks are required:

- Analysis of concepts and technology for data and knowledge visualization
- Development of a generic concept for knowledge visualization
- Application of the generic concept to the sport sciences
- Feasibility and practicality of the developed concept have to be proven in a prototypical implementation

All steps have to be carefully documented. The Thesis has to be written in English. Work in Knowledge Engineering will be conducted in cooperation with Antonio Vetrò from IN4 Software & Systems Engineering

Prerequisites

- All prerequisites for a Master's Thesis
- Experience in .net / C# or in another OO programming language
- Interest in Visualization or Computer Graphics

Supervisor

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