



Software Design EXECUTIVE SUMMARY



S.M.I.L.E.

SMART MULTIPURPOSE INTERACTIVE LEARNING ENVIRONMENT



CAFFEINE 2 CODE

MENTOR : Professor Mária Bieliková

STUDENTS : Marko Divéky, Peter Jurnečka,
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SMILE: SMART MULTIPURPOSE INTERACTIVE LEARNING ENVIRONMENT

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Modern technologies have brought many innovations into the system of education. Learners of any age now have the opportunity to educate with the help of many electronic materials. However, the majority of young learners find studying from such materials less exciting than playing today's popular computer games that obviously lack signs of education. We promote the usage of computer games, since they offer something that learners cannot get from any present kind of electronic or printed study materials – enjoyment and fun, both of which play a crucial role in effective learning. Our system – named **SMILE** – combines the educational potential of electronic study materials with the excitement of computer games by giving teachers the ability to effortlessly transform study materials into exciting educational games playable even by handicapped students.

SMILE enables teachers to create or import various study materials and to define game objects associated with them, along with their relationships. Afterwards, the system generates interactive three-dimensional games with tasks based on the game objects related to the submitted knowledge. The whole creational process is supervised by teachers, who have full control of the created games' content and difficulty. Learners are then ready to play the available games, in which they accomplish tasks requiring the comprehension of study materials they are based on.

Users interact with the system using various devices. We have paid special attention to the design of interfaces and to make the system adaptive enough to support handicapped pupils. For example, learners with a sight handicap are able to control the system with voice commands and can have the contents of all educational materials read to them using a computer-synthesized voice and/or are able to have all text in the study materials shown as large as they prefer. Similarly, deaf learners are presented with subtitles below every video or audio file. Specialized interfaces enable handicapped users to participate in the educational process by playing educational games with their classmates, and thus socialize with the community.

The most important benefits that the system brings to society are:

- Dynamic generation of educational games based on teachers' preferences without requiring any knowledge of programming.
- Interactive forming of teams from students handicapped or not, in which they compete by combining their strengths and weaknesses – resulting in a better education for all.
- Adaptation to every learner's individual level of knowledge and game progress.
- Flexibility of the created games for all age groups.

Through a technical point of view, the most remarkable advantages of the **SMILE** system are: separation of the games' representation and content from their realization, modular architecture combined with web services, usage and utilization of the newest technologies.

All utilized technologies, including development tools, are illustrated alongside with the system components they are used in, in the following table:

	Visual C# 2005	Visual C++ 2005	SQL Server 2005	IIS Server 6.0	.NET 3.0	XAML	WPF	.NET Web Services	Speech SDK 5.1	SQL Native Client	TGEA 1.01	MSXML 6.0
Game Client	✓	✓						✓	✓	✓	✓	✓
Game Editor	✓				✓	✓	✓	✓				✓
Game Server	✓	✓						✓		✓		✓
Knowledge Editor	✓				✓	✓	✓	✓				
Knowledge Viewer	✓				✓	✓	✓	✓	✓			
Local Knowledge Base			✓	✓				✓				
Shared Knowledge Base			✓	✓				✓				
Statistics Viewer	✓				✓	✓	✓	✓				
Statistics Web Service	✓				✓		✓	✓				

