

# Using Virtual Companies in Teaching Artificial Intelligence Related Subjects<sup>a</sup>

**Peter Sinčák, Adrián Tóth**

Center for Intelligent Technologies, Department of Cybernetics and AI  
Faculty of EE and Informatics, Technical University of Košice, Slovakia

*Abstract:*

*The papers deals with the educational approach at Center for Intelligent Technology in Department of Cybernetics and Artificial Intelligence, Faculty of Electrical Engineering and Informatics – Technical University of Košice, Slovakia. The subject „Computational Intelligence“ is an introductory subject with aim to introduce Computational Intelligence tools as approaches which can be useful in number of real-world problems. The aim is to motivate students in team work, ability to discuss highly scientific problems and support students creatively to look for application potential of Computational Intelligence tools in various applications. Students establish their own companies, discuss various AI issues, contact and discuss problems with real companies and gaining their own view about application of AI in the industry. Students make the promotion and final presentation on the final exam and put their presentation on the WEB in multimedial form to attract other students to study Artificial Intelligence MSc. Branch at our department. The students like this form of pedagogical approach and take their virtual company very seriously, contact the local companies and share the view of AI with industrial people. The promotion of the department is also well improved and students enjoy the new and unique approach how to understand high-tech technology and their application potential in real-world applications.*

## 1. Introduction

Artificial Intelligence plays an important part of the concept of the higher degree of information society so called Ambient Intelligence concept which has been promoted in the EU – ISTAG (Information Technology Advisory Group) workgroup outcome. The report called “Ambient Intelligence” proves the importance of Machine Intelligence in the overall framework of new generation of complex information systems. According to these facts the new generation of experts related to these challenges is very important and needed for advance new understanding of information society with full Machine Intelligence concept. More information can be found in internet sources.

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## 2. Teaching Computational Intelligence

Computational intelligence is a comprehensive subject which has some of the goals in the concept of overall AI branch teaching in the Faculty of EE and Informatics. The goals are as follows:

- a) Attract students to the importance and the future of Machine Intelligence in next generation of information systems
- b) Reveal the application potential of Machine Intelligence by students and support the students creativity in finding useful applications in local industry
- c) Contact the local companies made by students and promotion of machine intelligence tools among the industry
- d) Understanding the usefulness of machine intelligence by students and encourage the machine intelligence in next generation of information systems.

Students after introductory lessons are recommended to gather into virtual companies. These virtual companies must have pre-defined structure as follows:

- a) President of the company
- b) Promote manager
- c) Sales manager
- d) Case-study analytic
- e) Programmer in C++ language
- f) System Programmer

Students are asked to contact the local companies to get real-world data and make pilot experiments with data to make pre-project information for possible application of machine intelligence in the companies. In schools year 2001-2002 we have had many virtual companies e.g.

- a) Intelligent traffic systems – students contacted the local traffic police department in Košice to get info how to improve the handling the traffic related problems in Košice
- b) Money note recognition systems – students contacted the leading Bank in Košice to develop the note recognition counter for banking personals. Students have developed the pilot project with fast and full recognition of EURO notes. Students have designed the neural based system for note recognition of EURO notes. System was very reliable and fast.
- c) Intelligent prediction systems for betting companies – students have contacted the local betting company with aim to study the possibility of using the machine intelligence in prediction of rated in British football league and World Championship in Ice Hockey in Sweden 2002. The pilot prediction system was made

by neural approach and students have used the data provided to them by companies. One of the particular results was the prediction of the ice-hockey match between Slovakia and Russia in the Championship final. The prediction was 75 % for Slovak team which was a very good prediction.

- d) Intelligent Hot House systems – students have contacted the local Botanical Garden with the aim to design the theoretical project of intelligent system for fresh air control for selected fauna based on experience of experts.
- e) And many other practical projects

Students were led to approach the problem using the basic concept of building intelligent system as is on the following 2 figures.

## Intelligent System

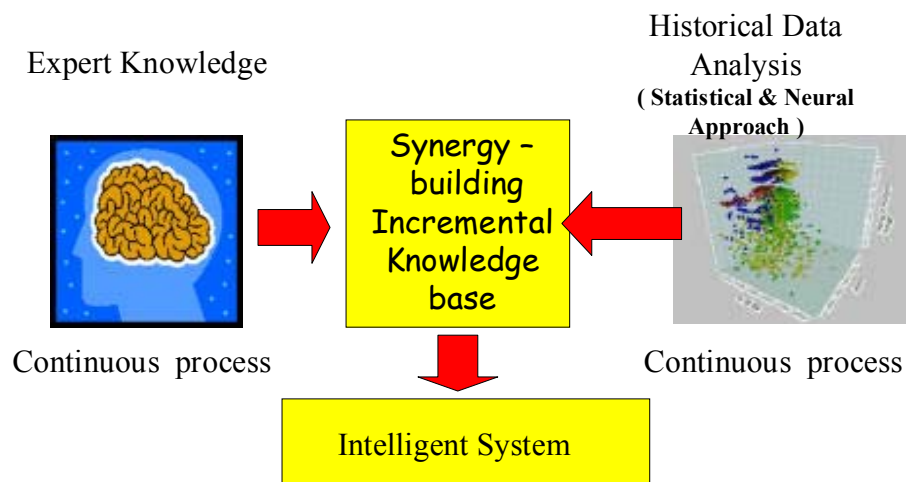


Figure 1: General Concept of creating Intelligent Systems

## General Architecture of InT

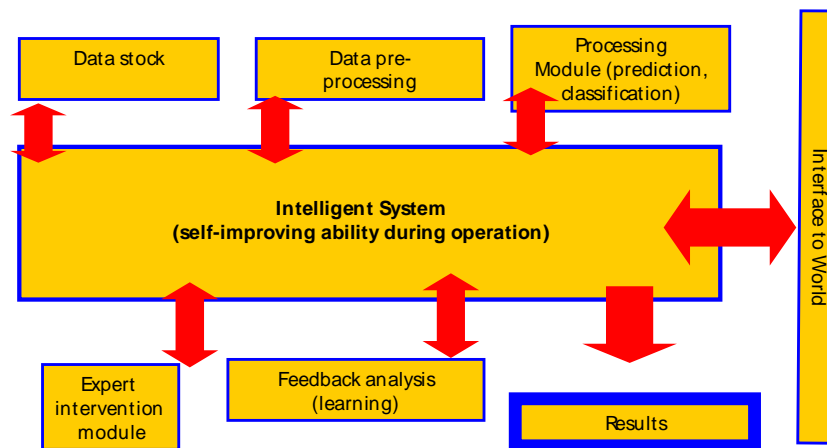


Figure 2: General Architecture of Intelligent Systems

The above principles lead students to think about the application potential of Machine Intelligence. The response of the students is very positive and students are asked to make their company presentation which is recorded and ported on the internet to inform the Cyberspace about these activities. In fact we can state that the teaching can be done by 2 ways of approach as follows (from students perspective – it is learning) :

1. learning by being told
2. learning by Exploration

It is obvious that this approach using virtual companies is “Learning by exploration” and even more because students are being missionaries of AI and new technologies in general and that is a position what we do need to have them.

### **3. Conclusion**

The concept of teaching Machine Intelligence related subject is based in project oriented approach. Students are lead to work in teams (virtual companies) and are recommended to contact local companies to find an interesting application for machine intelligence technologies. The presentation of these “companies” is very inspiring and creative. We do strongly believe that this approach in teaching can bring more attractively the Machine Intelligence technologies among the students.

#### Literature

- [1] Prof. Claudio Moraga, University of Dortmund – personal communication
- [2] Robert Aiken, Richard Epstein : AI in Education – Starting the discussion
- [3] Fredrik Heintz et al: Using Simulated Robocup to Teach AI in Undergraduate Education (Internet source)