Šárka GERGELITSOVÁ, Tomáš HOLAN
Charles University in Prague, Faculty of Mathematics and Physics
Department of Software and Computer Science Education
Malostranské nám. 25 118 00 Praha 1 – CZECH REPUBLIC
Tel./ fax: +420-2-2191–4217/ e-mail: sarka@gbn.cz, tomas.holan@ksvi.mff.cuni.cz

LOST IN 3D SPACE

Are you always well aware of the position of yours if you turn a few corners in the town unknown to you? Are you able to follow the relative positions of objects that are moved and rotated? Do you want to measure your or your students' spatial abilities or to train them?

Cultivation of different students' spatial abilities requires a lot of teacher's effort and time. We were looking for a new tool that could help teachers to measure some aspects of spatial abilities of their students and train them as well, something that could do it effectively and without any additional effort of the teacher himself. So the Labyrinth was born. This computer online web game can attract people's concentration and keep them buried in our virtual 3D "cubed" space where they are moved and rotated without possibility to see any surroundings except for the nearest neighbouring cube. It is a Flash application of very simple environment and controlling.

For students it is usually hard to keep concentration on their work all the time required. However, just the concentration of mind is the most important aspect in training spatial abilities.
A computer game may be the appropriate tool because of its power to keep one's attention.
The Labyrinth tests and trains one's ability to keep the awareness of the position and orientation in the space during motion.

Records of all the attempts to the Labyrinth are kept in a database, which allows us to display the player the information about his advancement. It also provides useful data for the later observation of the player's abilities. But it is not easy to do it from the text record of the tracks and it requires some tool that makes it possible to display the tracks digestedly.

The aim of this paper is to present not only this didactic game, but also a VRML environment that provides two ways for emerging from the game "blind" 3D world and seeing the routes from the outside. The first one is a 3D preview of particular task's tracks that were attempted by all players. The latter one is an interactive background for the particular player himself. It shows him all the tracks he followed while solving the task chosen. Its interactivity allows the player to re-play any track in order to observe possible mistakes he has made or to see a better track. He can also suggest and test new tracks he has not tried in the game.

We offer these programs and mention some experience with using this software by players of different age including adults.
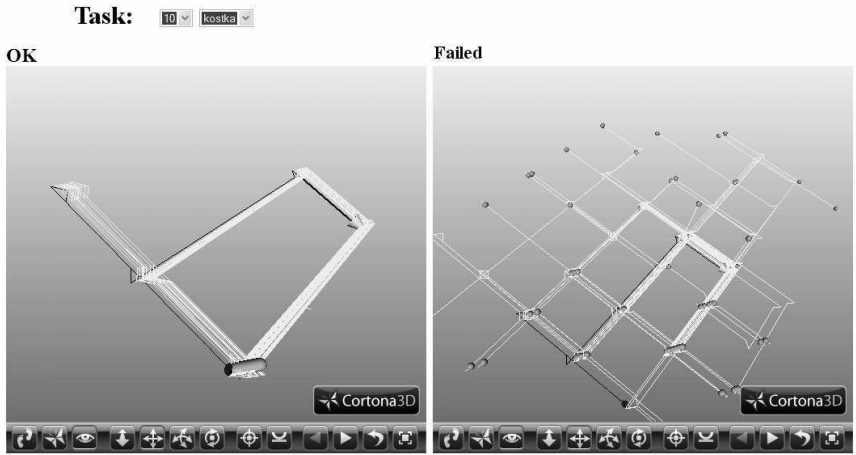
Fig. 1. An example of both correct and wrong answers for one of the tasks visualised in VRML scene.