Project-Seminar

Object Oriented Realization of an Internet Information System

WS 2007/2008

Thursday, 14:30 – 18:00, Harburger Schloßstr. 20, Raum 206

Goals

At the end of this project, students will be able

- to apply **object oriented analysis, design and implementation !!!!**
- to apply concepts, techniques and tools of modern information and communication systems:
  - system architectures
  - component based development
  - …
- **to work in teams in a project-oriented way** (milestones, limited resources) **!!!!**
- **to present and defend their results in front of a technical audience !!!!**

Preliminaries

Language:

- All slides in English
- Presentations in German or English
- Every presentation held by all team members

Project work in small teams

- 3-4 persons per team
- Project management by the team itself!
- One supervisor per team, helping the team on request

Project Plan with Hard Deadlines

1	25.10.	Introduction
2	31.10.	Definition of a project proposal
3	25.10.	Agreement on the description of work based on the project proposal.
4	22.11.	**1**st **Milestone**: Presentation of the design
⋮		
5	17.01.	**2**nd **Milestone**: Presentation of the implementation so far
⋮		
6	07.02.	**3**rd **Milestone**: **Final Presentation**

Pacman as it used to be ...

Ingredients for the arcade version known from the 80's:

- a maze

- Two parties:

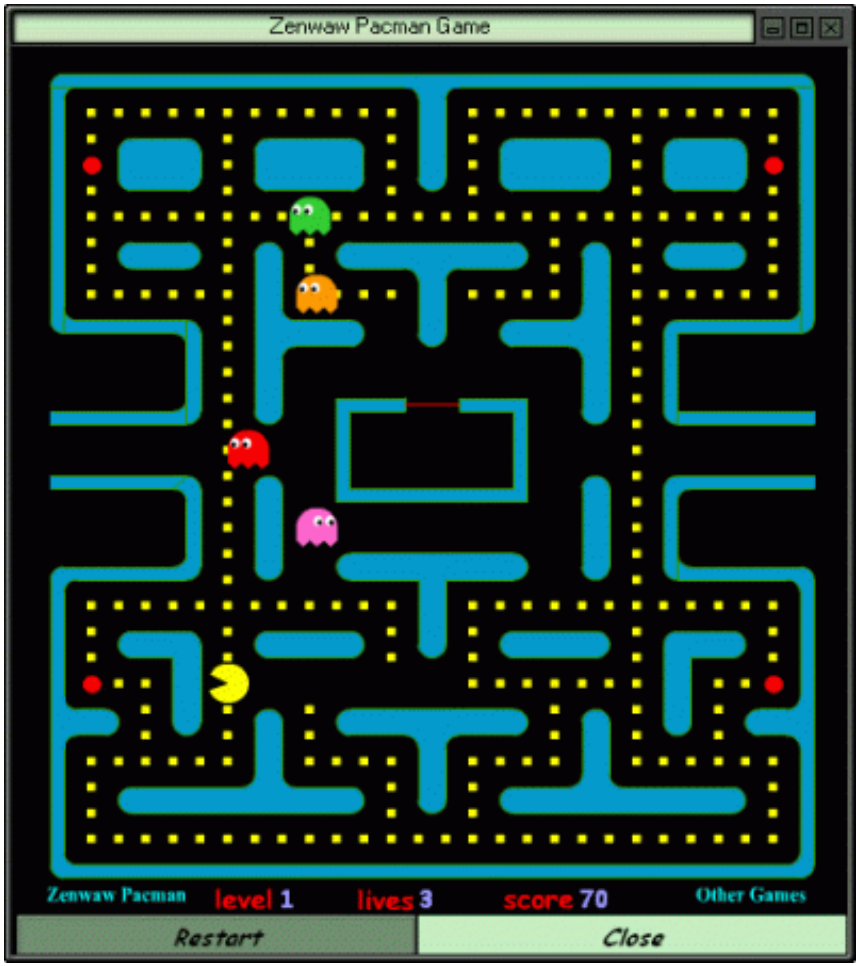
  - **Pacman**: tries to collect as many gold nuggets as possible

  - **Ghost**: tries to prevent Pacman players from collecting gold nuggets, by killing the Pacman player.

The game is over if either

  - the Pacman has collected all available gold or

  - the Pacman's life counter is reduced to 0



Pacman goes Mindstorms

- Pacman players and the Ghost are replaced by Lego Mindstorm robots
- Labyrinth is replaced by marked lines on the ground
- Ghost try to
  - kill the Pacman players

Pacman Project - 1

- 2-3 Groups; 2 x Pacman, 1 Ghost
- Minimal requirements for **Pacman**
  searches for gold nuggets. The Pacman players have won the game if all gold nuggets are collected. A Pacman has 3 lives. A Pacman player dies if the Ghost has collected all his lives.
  - Can detect roads and is able to drive on a road.
  - Can detect the gold nuggets and is able to collect them.
  - Can detect the *Ghost* (*Ultrasonic sensor)* and is able to escape.
  - Is able to somehow hinder the Ghost, e.g., can switch on a light (maximal two times) so that the *Ghost* takes another way because the Ghost is afraid of light.
  - Informs a “referee” if he loses a live. This information should also be shown on a web page.
  - Defines and implements a strategy for validating the software/rules of the game (to be validated by other groups)
  - Can communicate with a software agent via Bluetooth. The software agent is responsible to pass events to the web page. The agent can also be used for computation, storage of gathered data and implementation of strategic behaviour.

Pacman Project - 2

- Minimal requirements for **Ghost**
  drives on roads and collects as many Pacman lives as possible. Has won the game if all lives are collected. Gets a life if he touches a Pacman.
  - Can detect roads and is able to drive on a road.
  - Can detect a Pacman player (*Ultrasonic sensor)* and is able to collect its life by touching him.
  - Respects the hindrance of Pacman and takes another way (see Pacman requirements)
  - Informs a “referee” of collecting a Pacman life. This information should also be shown on a web page.
  - Defines and implements a strategy for validating the software/rules of the game (to be validated by other groups)
  - Can communicate with a software agent via Bluetooth. The software agent is responsible to pass events to the web page. The agent can also be used for computation, storage of gathered data and implementation of strategic behaviour.

Lego Mindstorms Equipment

- Programming Environment: Java (Jelos)

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- Servo Motor: Includes a built-in rotation sensor that measures speed and distance
- Touch Sensor: It can detect single or multiple button presses
- Light Sensor: Enables your robot to distinguish between light and dark
- Sound Sensor: for measuring noise levels in both dB and dBA
- Ultrasonic sensor: helps your NXT robot judge distances and "see" where objects are
- Bluetooth
- Colour Sensor: can distinguish some colours (see spec.)

Proposal

- Each group has to deliver a proposal until 31.10
- The proposal should contain
  - Project description
    Write down your own understanding of the topic and go beyond our description.
  - Project planning
    Define details about main steps, timing, organisation of work.
  - Strategies for problems to be solved
    For each of the problems describe a strategy, which you want to apply to solve the problems. Some problems were already mentioned on the slides.
  - Qualification and Motivation
- A template for a proposal can be found on the RIKA homepage