

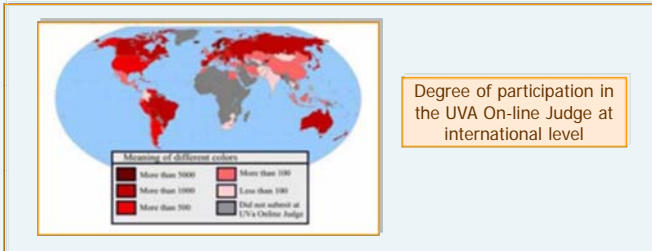


Introduction

- This poster presents the design of a distributed asynchronous system to allow remote and/or automatic evaluation of students' submissions in on-line contests in the frame of e-learning processes.
- The system is being developed in the context of the **EduJudge project** that has as starting points the on-line programming trainer **UVA On-line Judge** and the competitive e-learning tool **QUESTOURnament**.

The UVA On-line Judge

- On-line programming trainer created in 1995 by a research team of the University of Valladolid led by Miguel A. Revilla.
- Currently, it has more than 70,000 users in different countries and more than 2,000 problems.
- Users can send programs which solve the different problems proposed and the system automatically provides feedback indicating if the code is correct or not.
- Current users are demanding a greater pedagogic character for this tool.



Degree of participation in the UVA On-line Judge at international level

The QUESTOURnament tool

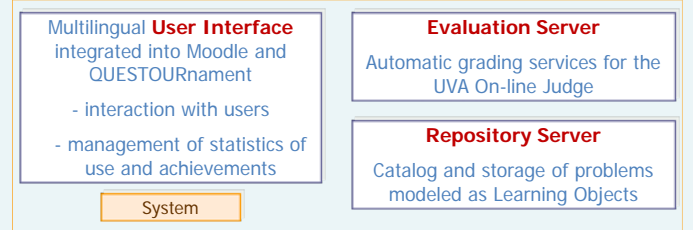
- Competitive active e-learning tool: The sessions are presented as a contest with intellectual challenges to be solved in a time-constrained way whose answers are rewarded by means of a variable scoring system.
- Flexible: individual and group work contests, students can propose challenges, teacher can set several parameters (maximum and minimum score, number of answers to be accepted...).

The EduJUDGE Project: Integrating the UVA On-line Judge and the QUESTOURnament tool

The objective is to give a greater pedagogic character to the UVA On-line Judge to adapt it to the needs of a formal educational environment.

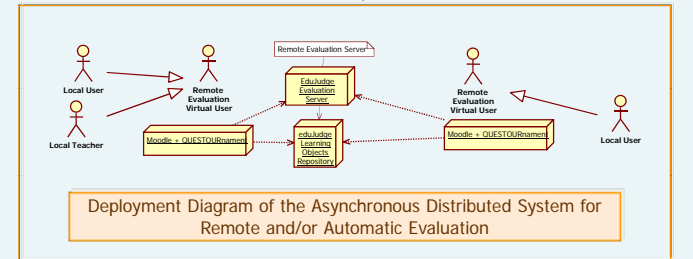
- Tasks to be developed:
- Improving accessibility and usability of problems by defining metadata and creating a remote problem repository.
 - UVA On-line Judge able to classify problems according to their level of difficulty and to undertake a gradual evaluation.
 - Distributed system for remote and/or automatic evaluation so that the application field of the system can be extended.
 - Effective integration of the UVA On-line Judge into QUESTOURnament and other services available in the open source e-learning platform Moodle.
 - Decentralized management of courses, teachers and students by means of installing Moodle with the QUESTOURnament module locally at every institution that uses the UVA On-line Judge.

Distributed System for Remote and/or Automatic Evaluation



Features:

- Possibility to be used with any kind of problem and in any education level where evaluation can be outsourced and executed by any type of evaluation server (automatic evaluation engines like UVA On-line Judge, human evaluators like an expert in a subject...).
- Standard-oriented services that allow other platforms and systems to interact with the EduJudge components (i.e. an EduJudge Evaluation Server can interact with different Learning Object Repositories).
- Problems modeled as Learning Objects. Standard e-learning platforms and tools could use the existing problems, provide new ones to the EduJudge repository...
- The EduJudge repository will receive feedback from clients (on Moodle) and evaluation servers to allow the automatic classification of problems.



Conclusions

- The UVA On-line Judge has an important number of users worldwide who will benefit from the improvement of its pedagogic character. Its use will be extended to scenarios other than Universities and to fields of knowledge other than programming.

Current State of Work

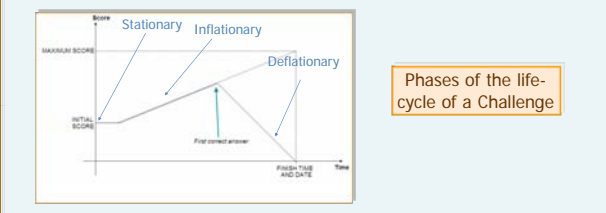
- The EduJudge project started on January 1st, 2008 so that the work is still in an early phase of development.



Life-cycle of a challenge:

Phases:

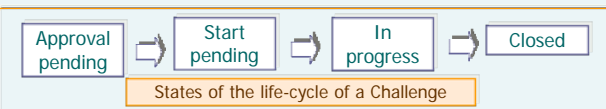
- Stationary phase: score remains during a period of time to allow students to understand and to take in the task.
- Inflationary phase: score grows to adjust reward to difficulty. It is assumed that a lack of correct answers means that difficulty is higher than reward.
- Deflationary phase: once a challenge is correctly answered, score starts decreasing so that the student who answers first gets the maximum score.



Phases of the life-cycle of a Challenge

States:

- Approval pending: a challenge has been proposed by a student but not approved by a teacher yet.
- Start pending: each challenge has start and end dates. Answers can be received only during the intermediate period.
- In progress: challenge is fully active, answers are received and scoring is varying.
- Closed: time to answer is over, and no more answers are allowed. Students can read all submissions.



States of the life-cycle of a Challenge

Acknowledgement

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