Computer Graphics Seminar

MTAT.03.305

Spring 2015

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CGLearn

- Online learning environment
- Implemented in PHP and JavaScript
- Used in the Computer Graphics and Computer Graphics Seminar courses
- 15 topics in 2 modules – Basic I, Basic II
- 7 topics in Game Engines module
- 4 topics in Base Module (for the seminar)
- 45 interactive examples, 200 flashcards
- My Master's thesis
Online Learning Environment

- Previously no clear and official material
- Accessible everywhere (online)
- Supports the CG and CGS courses:
  - Can learn via reading the material and examples
  - Can test yourself via flashcards
  - CG course has tasks, which can be submitted and graded by teachers
    - Also gives a statistical overview of all the results
  - Examples can be used in lectures (fullscreen)
Implementation

• Back-end in PHP
  • Laravel Framework
    – Modular architecture
      • Teacher and Student modules
    – Service oriented architecture
    – Model-view-controller paradigm
      • Blade HTML templating
  • Shibboleth authentication service (UT login)
  • MySQL database
    – Doctrine ORM (data mapper pattern)
Implementation

- Front-end in JavaScript:
  - Three.js library for examples
  - jQuery for DOM manipulation
  - Require.js for async module loading
  - MathJax for math formatting
  - Bootstrap for an aesthetic look
Implementation

- Work started in August 2014
- Functionality for the fall of 2014:
  - Modular structure of courses
  - Material writing, reading
  - Examples
  - Flashcards
- Functionality for the spring of 2015:
  - Tasks, grading, feedback, e-mails
  - Statistics and students results table
  - Fullscreen examples
Material and Examples

- See in CGLearn: https://cglearn.codelight.eu
CGLearn Feedback

- Written material – The ability to read the material online in CGLearn.
- Interactive examples – The ability to use sliders and buttons to modify the parameters of computer graphics algorithms, and see the results.
- Flashcards – The interactive tool, that allowed you to learn and test your knowledge.
- Task tree – The tree, that showed the tasks by topic. Each task indicated its status, showed your score and the average time spent on it by other students.
- Task descriptions – The detail view of a task often (re-)explained the techniques required for the task, included illustrations and instructions for the solution.
- Task feedback – The ability, that you received feedback in both CGLearn and to your e-mail. You were also able to respond to feedback in CGLearn.
- Statistic charts – Statistics page showed the average, minimum and maximum score, time spent and difficulty estimations, together with your values, for each task.
- Results table – Overall table, that showed the total amount of score you and other students received from different modules, project and the exam.
Further Development

- Make some part of the material public
  - Concrete modules / topics together with tasks
  - Separate layout for those public pages
  - Open for a wider audience, then just UT
- Improve the architecture, to better suit next conductions of the CG and CGS courses
  - Changes in the material? Changes in the tasks?
  - New statistics each time? Comparison with old?
- Fix some current bugs
  - Eg who can submit task solutions?
Thanks for listening!