openHPI: Advanced Web Programming Topics for MOOCs

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Topics

Presentations and project works in teams of 2-4 people. Additional topics available on request. We are open to topic suggestions from participants, as long as they fit in the context of openHPI / MOOCs.

Topic 1:
Offline Availability of Web-Apps and Mobile Usage

How can we use Technologies like Service Worker and Client Side Rendering to enable learning with no or low internet connectivity? Can these technologies also be sued to increase the site performance und the user experience for users with a good internet connection?

Topics

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Topic 1:
Reusable Microservices for Gamification

Christiane Hagedorn, Jan Renz, Christian Willems

openHPI features a basic gamification service. While this can be considered a first iteration, it can not be considered resusable in other contexts like schul-cloud.

Task: Refactor service in a language/framework of your choice and make it portable and more flexible.

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Topic 2:
Conversational UI and Bots

Jan Renz, Thomas Staubitz

How can the Schul-Cloud (or openHPI?) UX can be improved by bots and Conversational UIs?

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Topic 3:
Real Time Editing and Collaboration

Christian Willems, Jan Renz …

For example in the openHPI QuizEditor

Topic 4:
AI / Machine Learning in E-Learning

Jan Renz plus colleagues from the chair

How can ML improve openHPI or Schul-Cloud? Stand-Alone Service or improvement of existing functions (Recommendation Engine for courses or content, Download Prediction, …)

Topic 5:
Static Code Analysis for Code Exercise Grading

Thomas Staubitz (plus colleague from the other chair)

Integrate Sonarqube (or similar tools) with CodeOcean to allow more advanced code grading mechanisms.

→ Transform code quality ➔ grade component

→ Visualize grading in CodeOcean

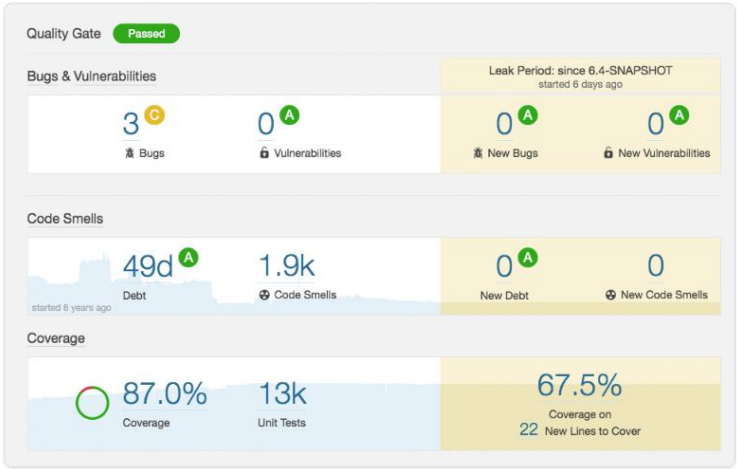


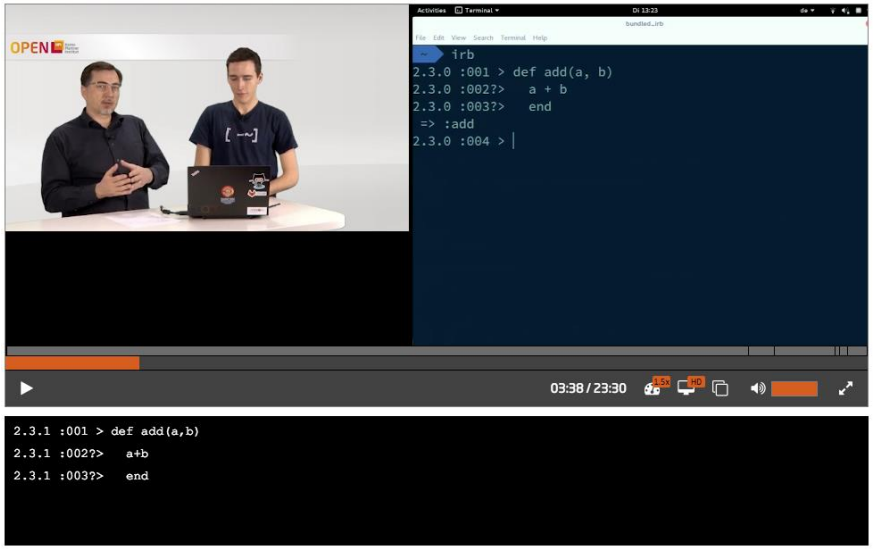
Chart 7

Topic 6:
Live Ruby Code Execution in the Browser

Jan Graichen, Franz Liedke, Christian Willems

Build live irb as client-side openHPI component

- Choose and integrate ruby-js implementation
- Handle common API requests, e.g.
  - File handling (with local storage?)
  - Network?
- Idea: record code (locally) and sync on later video replays



New Services and Apps / Pick your own topic

Prototype new services or stand alone tools to extend the openHPI feature set. This could also mean integrating existing or reusing existing apps. Example: Serverless Computing, Web Assembly, ……. Suggest a topic as a team or a single person.

Was wird erwartet?

- Talk about a new web technology that will be used or is evaluated by the team (25%)
- Attendance in the seminar
- Mid term presentation of the group project (10%)
- Final presentation of the group project (15%)
- Project Documentation (20%)
- Active contribution within group project (30%)