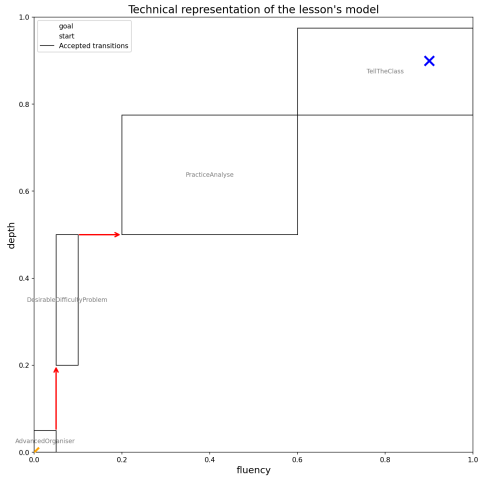
Fall Semester 2020 Research Project:

A Web Platform for Orchestration Graph-Based Lesson Planning

Jules Delforge
Supervisor: Pierre Dillenbourg

MOTIVATION

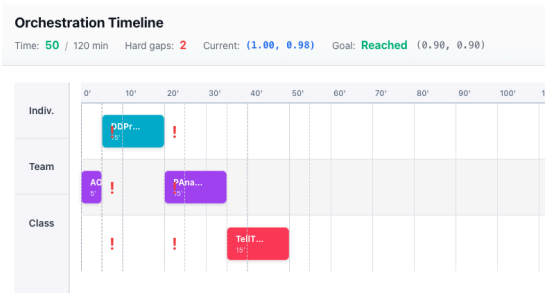
In this semester project, we furthered the implementation of an application that could help teachers in their lesson planning, in particular the usability of said application. The scope of the project was to find a solution to make a more polished version of the application.



METHODS

We designed a solution to port a previously functioning engine in PyQT/QML to pure Python in order to deploy it as a web application.

The engine recommends and manipulates activities in order to create orchestration graphs. To port the engine, we manually reversed-engineered the QT connections in order to clearly separate the engine logic from display. The display represents lessons using an orchestration timeline in three lanes.



RESULTS

The primary research topic was about how to port the engine to a more usable architecture while preserving its original design. Web development was chosen for usability leading to several heuristics on how to port the engine, some more rigorous than others, bringing to the final design choice. This design demonstrated great modularity compared to the original engine, making it easier to build off of.

The engine algorithm was modified to correct distance metric misbehaviours in some edge cases where it wrongly penalized activities when students exceeded prerequisites. Upgrading the greedy algorithm to allow it to backtrack seems like an effective improvement but was not tackled.

Link to the code repo: https://github.com/Julkzein/pdb See README.md and Reports/ subfolder