

Bachelor Project : StackOverFlow

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Friday 9th June, 2017

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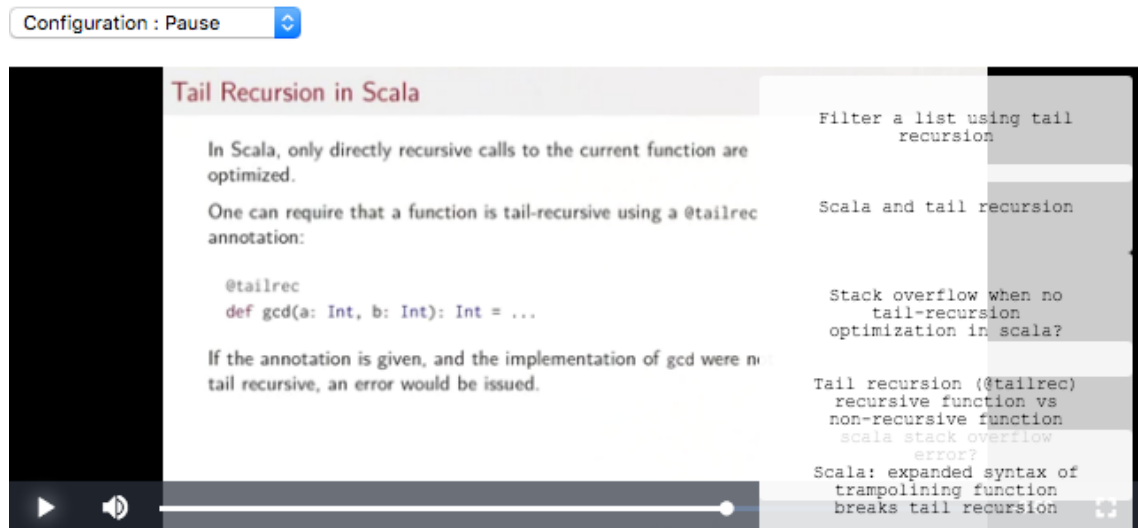
1 Introduction

The project aims is to provide help for online students who follow programming courses. We started from the observation that students often pause or seek back video when they have a difficulty. They do this to play back the content and try to better understand. So we try to provide them with some efficient help when they needs it. The main idea was to display some useful links when we thought they need it. To do this we try to match the current content of the subject with a question on Stackoverflow.

2 Development

This project takes shape of a video player implemented in HTML/CSS/Javascript. Basically the user can watch a video course and according to the selected configuration the player display different types of aid. There are 4 different configuration modes : **Default** - **Pause** - **Time** - **Help**.

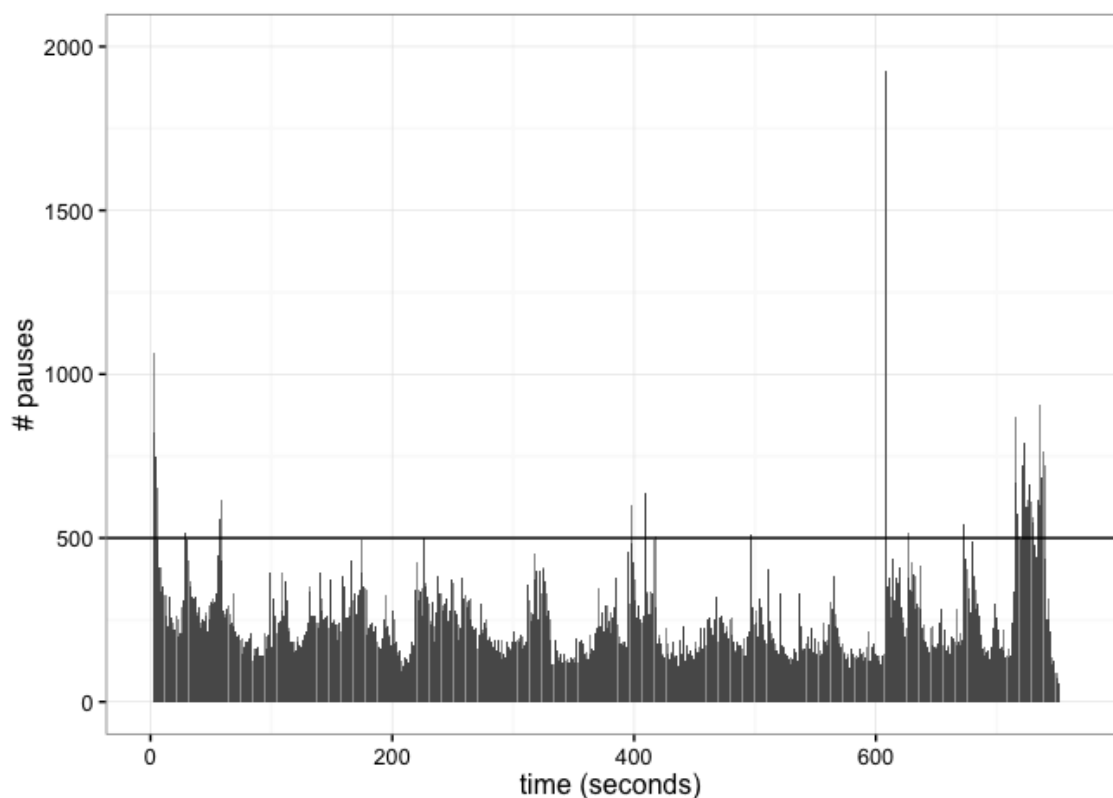
1. The **Default** mode, we do not provide the student any help.
2. The **Pause** mode. In this mode we provide the student with help when he pauses the video. This is a reactive mode.



3. The **Time** mode. Here we use the data collect from other students to know at which time the user is most likely to need some help. This is a proactive mode, when we reach one of these times we display help.

In order to determine the moments to provide help to the current student, based on the behaviour of the previous set of students, we follow the following steps:

- Collect all the clickstream data from the previous five sessions of the course for the particular video from Coursera.
- Compute for each second of the video, the number of times students paused, which resulted into the following histogram:



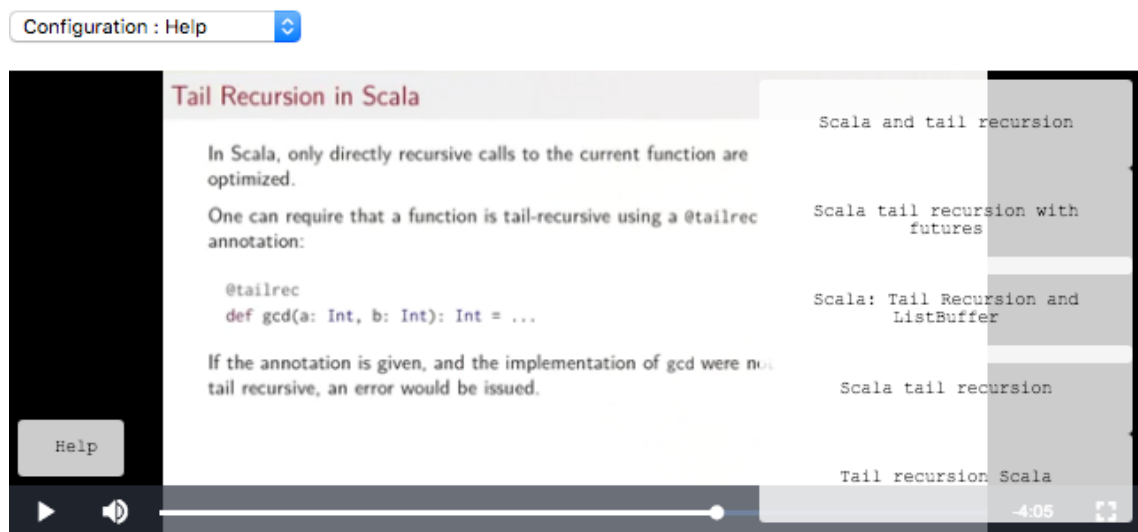
- Filter out the times with less than 500 pauses, after 10 seconds from the start of the video, resulting into the following times:

29,57,58,226,397,409,417,497,607-608,626,673,715-718,721-730,,734-739,752,753

- For the consecutive time slots we chose the mid point of the slot to show the suggestions, which resulted into the following set of times:

29,58,226,397,409,417,497,608,626,673,716,725,737,753

4. The **Help** mode. Here we simply add a Help button, and when the user click on this button we provide help. This mode is on demand.



3 Data extraction

Data extraction was an essential part of the project since we need data to help user. To do this I use the Stackexchange API which allows to retrieve the data sought in JSON format.

I use the Search functionality using:

<https://api.stackexchange.com/2.2/search/>

Then I use filter to sort result by relevance decreasing and I take the first five to display as overlay on the video.

I chose those filters after several personal tests, thinking this would be the most efficient for student.

4 Activity recording

To improve and individualize help in the future I implemented a recording activity using AJAX POST function and PHP.

The main goal is to store data for analysis it and see what is the best mode for this Helper, when students need help and which links is the most efficient.

That is why I record each video action (Play, Pause, Seek), the configuration mode (Help, Pause, Time), when the student clicks on the Help button and when he clicks on a link. The goal is also to individualize the help and the mode according to the user's preference and learning habit. To do this I also record an "id" to identify a user. I use fingerprintJS to identify the user, this technology uses different settings of the browser such as the screen color depth the language, installed plugins with supported mime types, timezone offset and other capabilities, such as local storage and session storage to identify a user. We could of course replace this system in the future with a Login. Then I record the geographical location because it is important to know the distribution of student who follow MOOC's from EPFL in the world and on each country.

I record an ID for activity and I only record ID of Stackoverflow answer until the whole url in order to minimize the recorded data on the server. I organised the log file as follows:

ID	Activity	Data
0	Init the video	ID_fingerprintJS;COUNTRY;CITY
1	Play	TIME
2	Pause	TIME
3	Seek Back	TIME
4	Configuration Help	TIME
5	Configuration Pause	TIME
6	Configuration Time	TIME
7	Click Help	TIME
8	Click LINK	TIME;ID_OF_THE_ANSWER

5 How to use it

First of all you need a local server environment like MAMP

Then you must download the Project

To do this open a terminal and follow those commands :

See the following command :

Go in your local server folder in our case MAMP:

```
$ cd /Applications/MAMP/htdocs
```

Then clone the github project

```
$ git clone https://github.com/enguerrandgrx/StackOverFlow.git
```

Then you can change the video and the subtitles file in the uploads folder.