Rock Your Page

A Chrome Extension Makes Your Webpage More Controlled

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Rock Your Page: Features Overview

Three Components:

- Page Sizer: adjust size of contents in web pages based on distance between your face and screen automatically.
- Page Rotater: map your 2D web page into 3D scene, multiple pags projection is also supported.
- Page Rocker: a small game which let your web page dance with music.

Figure : Overview of Components

Rock Your Page: Prototype

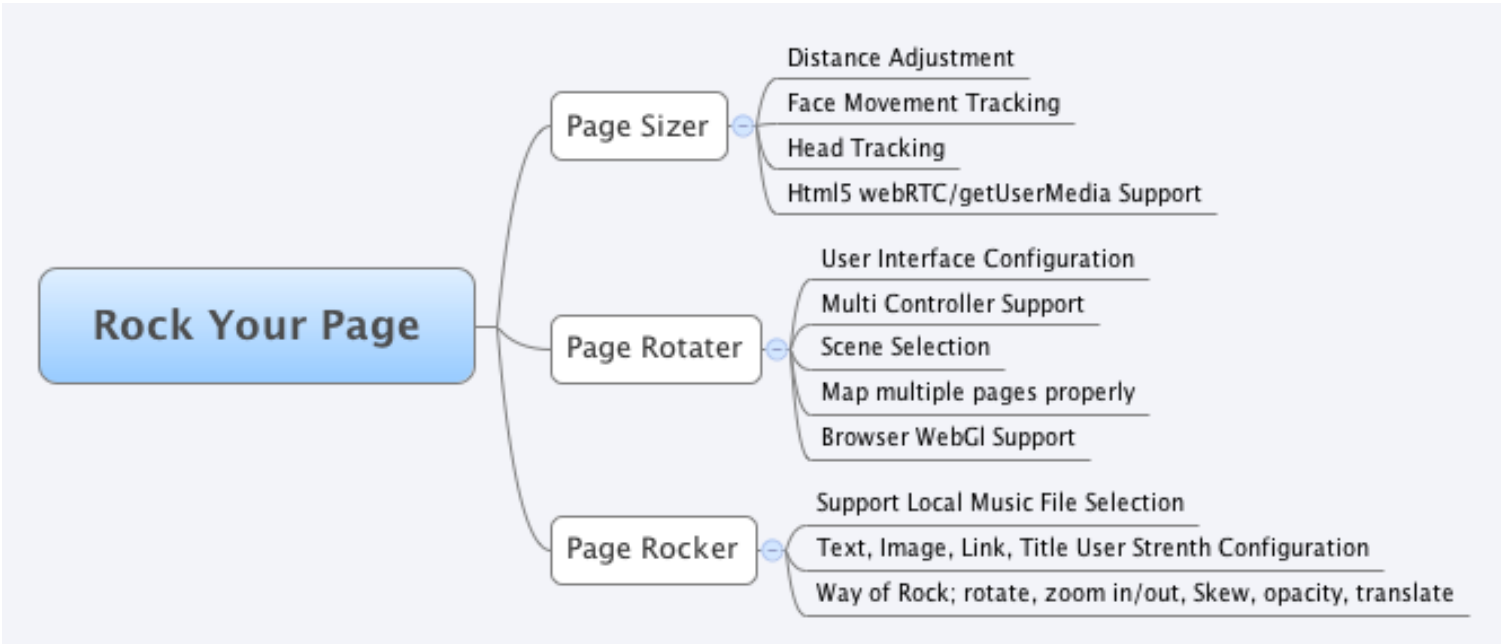

Figure : Prototype Design

Technical Overview: Chrome Extension Development

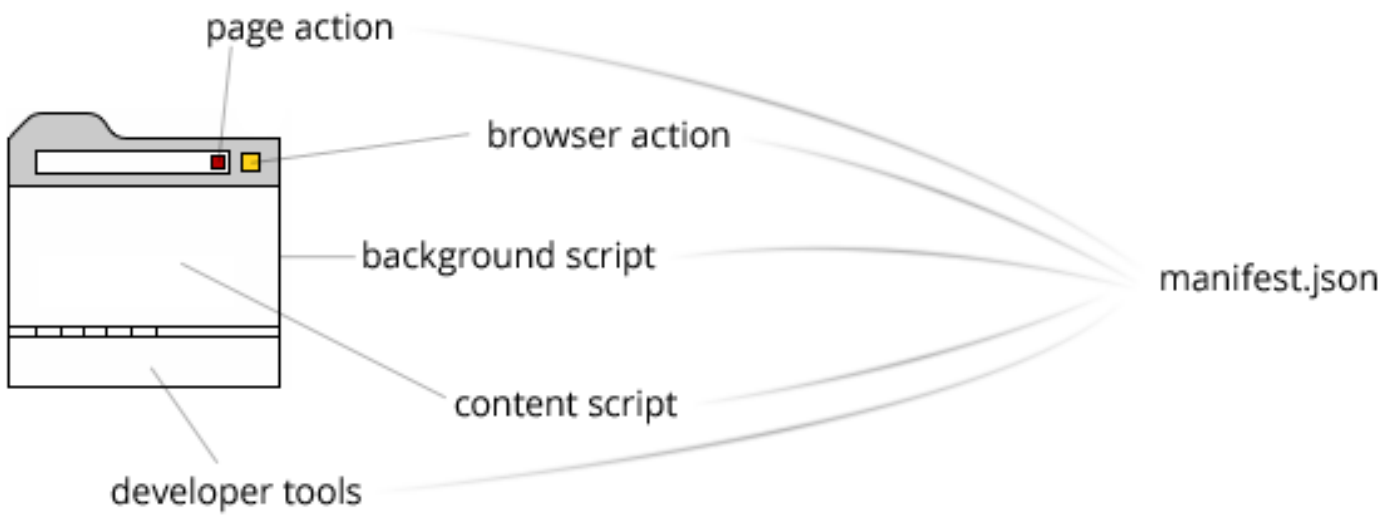

Figure : Architecture of Chrome Extension

Technical Details: Page Sizer

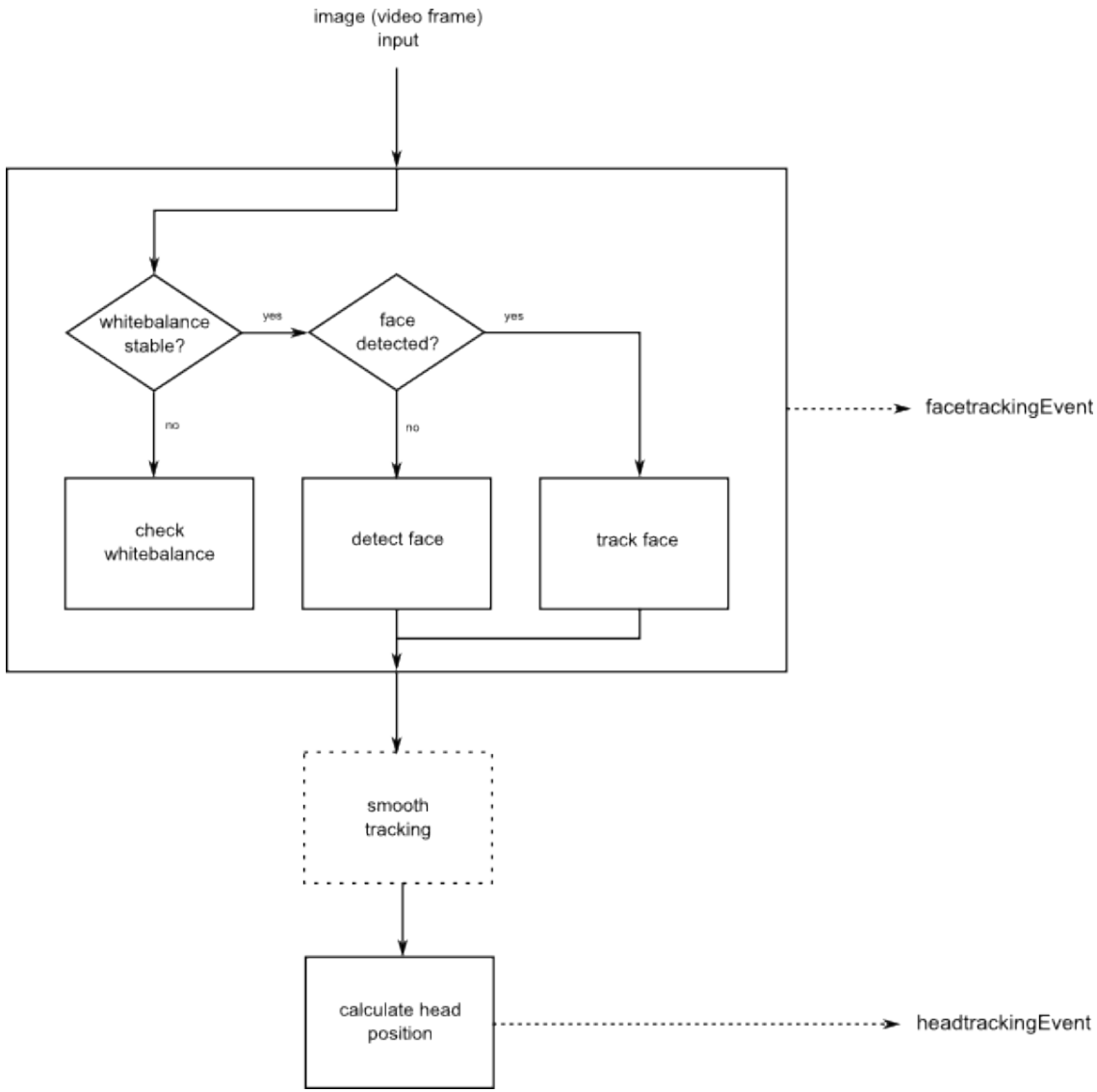

Figure : Face Detection in JavaScript

Technical Details: Page Sizer

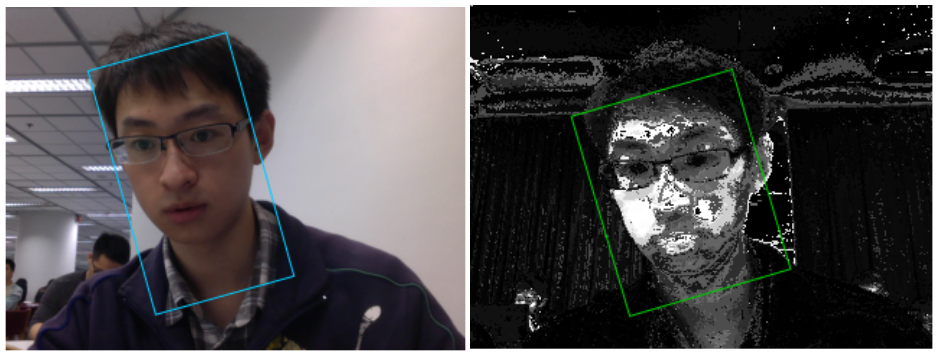

Figure : Realtime Face Detection Using Web Camera

Which element in web page shouled be sized?

- p,a,h1,h2,h3,h4,h5,h6,code,span,img,pre

How should we detemine the zoom amp?

$$zoom\_value = (face\_width/video\_width)/(face\_init\_width/video\_init\_width)$$

Technical Details: Page Rotater

One single web page mapped into 3D world.

Figure : One single Webpage Mapped to Three-Dimension Scene

Technical Details: Page Rotater

Map one or several pages into 3D world.

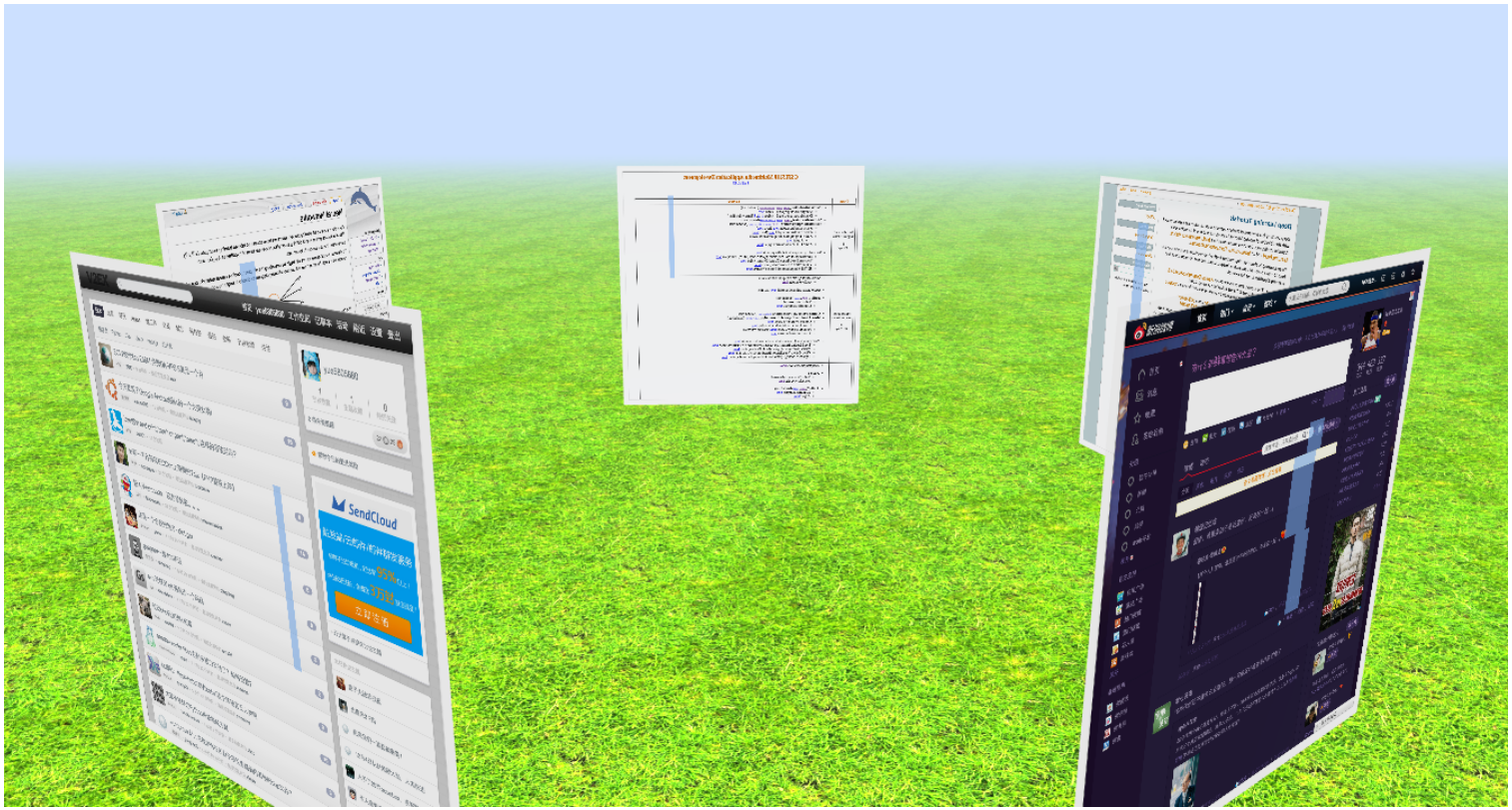

Figure : One single Webpage Mapped to Three-Dimension Scene

Technical Details: Page Rotater

How we could combine the current webpage with a 3-D Scene.

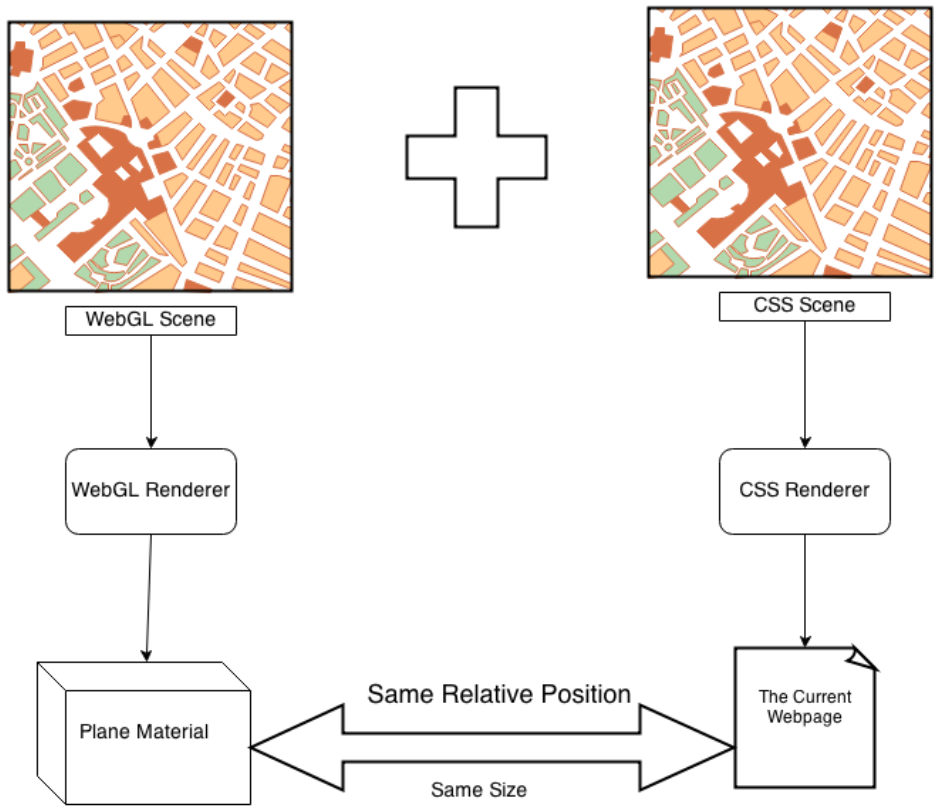

Figure : Map a webpage to a 3D scene

So even in 3D world we can interact with our pages individually without problem.

Technical Details: Page Rotater

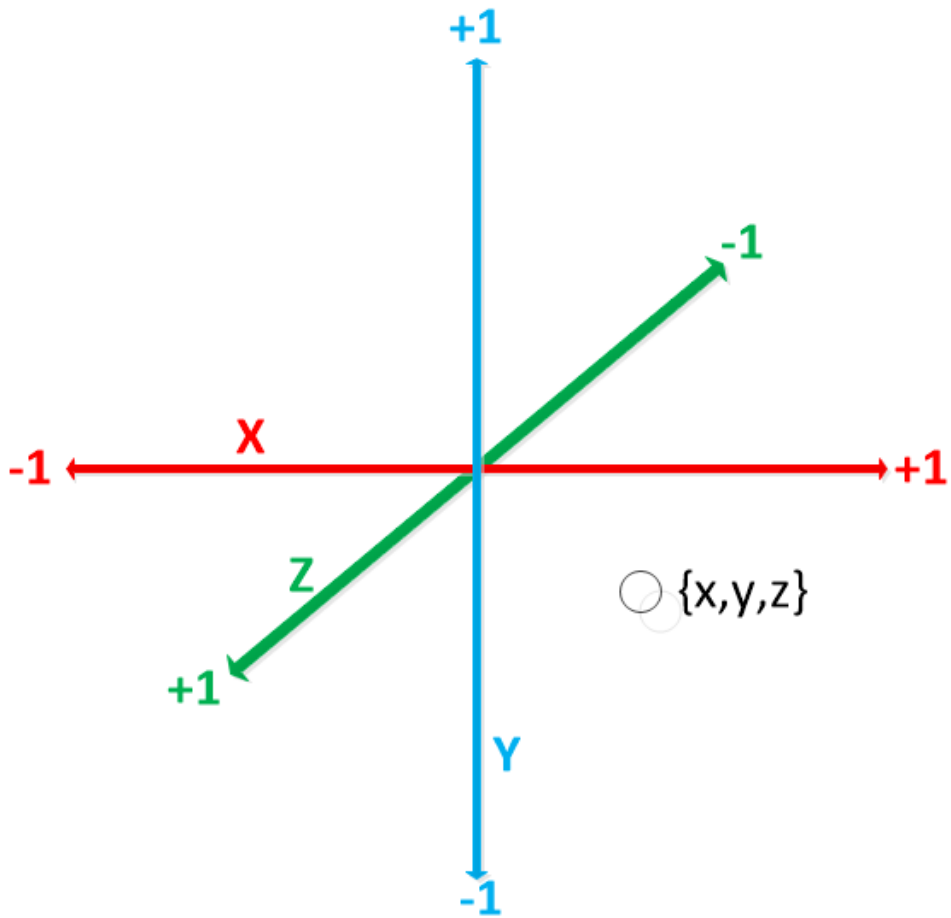

Figure : The Coordinate in ThreeJS

Technical Details: Page Rotater

When there n pages, how to set their position and rotation in 3D scene.

1. calculate the angle for the ith webpage: $angle = \pi * 2 * i/n$
2. The position of ith webpage: $Position_x = radius * sin(angle)$ and $Position_z = radius * cos(angle)$
3. The rotation of ith webpage: $Vector3(0, angle, 0)$

We provide two ways to control your page:

- Orbit Controller
- Pointer Lock Controller

Technical Details: Page Rocker

HTML5 Web Audio Context:

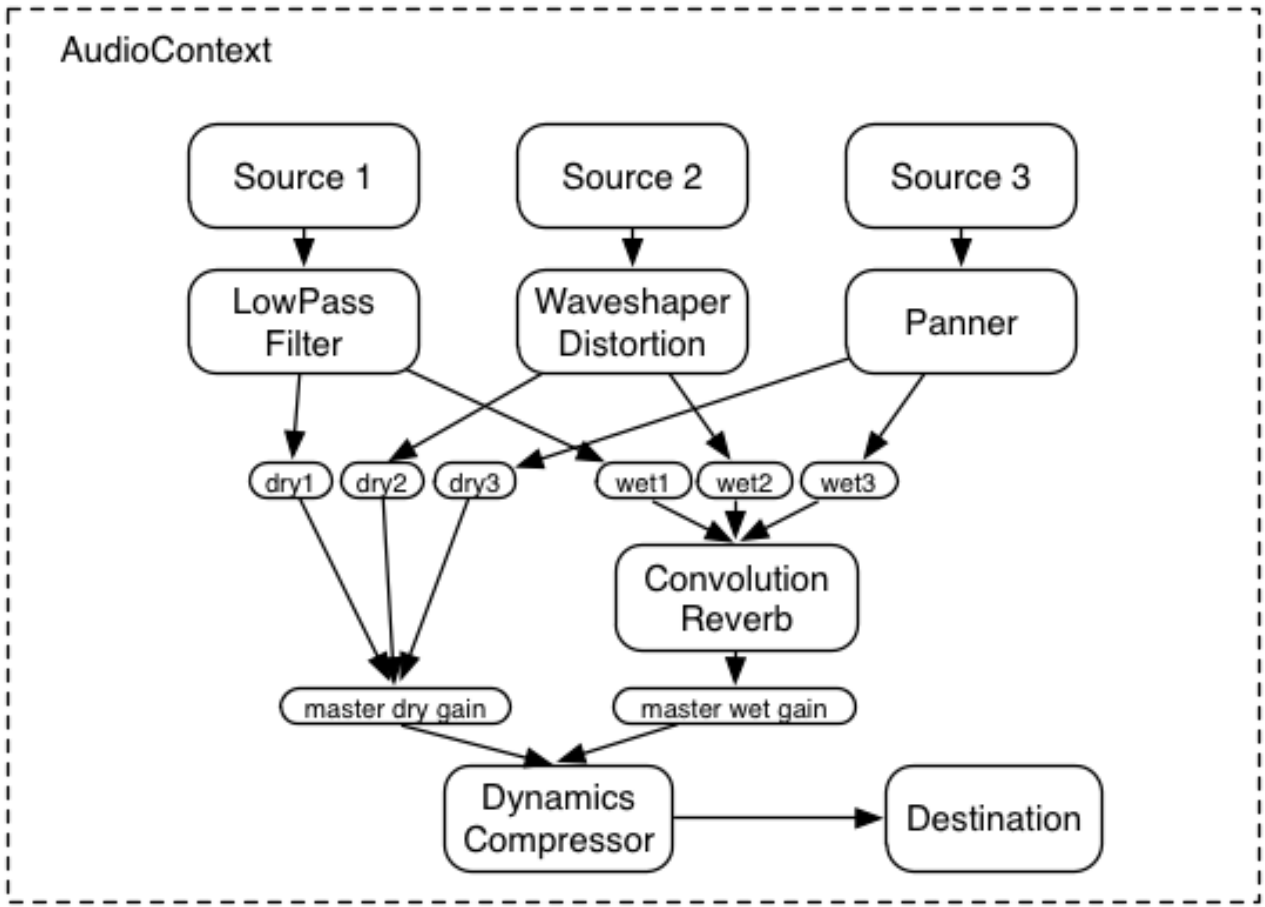

Figure : Web Audio Context

Technical Details: Page Rocker

Now Four Ways to make page dance with music:

- **ZoomIn/ZoomOut**: images
- **Position Transition**: paragraph
- **Rotation**: links
- **Skew**: titles

Technical Details: Page Rocker

Given An Elment, how to decide their action(samples), *amp* is the strength related to corresponding frequency(1 of 256):

1. Fisrt we check the type of the element
2. if *images*: $Scale = 0.5 + amp$
3. if *paragraph*: $Position_x = -10 + 20 * amp$
4. if *link*: $Rotation = (-30 + amp * 60)$ degree
5. if *titles*: $Skew = (-30 + amp * 60)$ degree

Technical Details: Page Rocker

But we can let user decide all the rocking details by providing configuraion

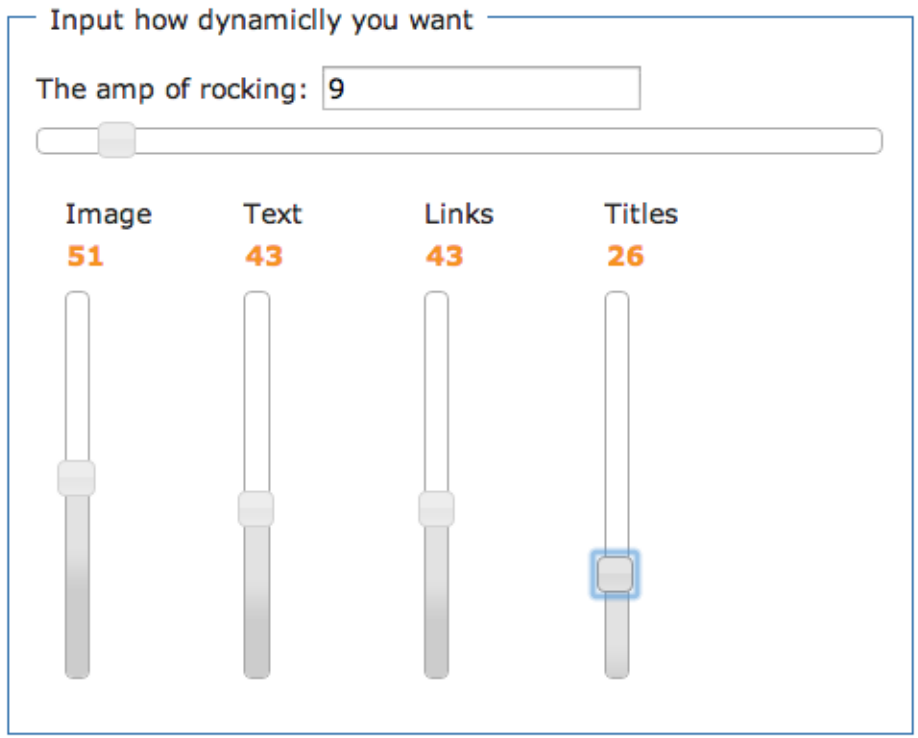

Figure : User Configuration for Rocking

Also, you can either choose one online music file or a local music file

Development Details

- *Dev Lauguage*: Javascript, HTML, CSS
- *Project Repo*: `https://github.com/KeithYue/PageRocker`
- *Team Work*:
  - LUO Xuan:
    - product manager
    - general/specific requirements analysis, prototype design
    - UI design, layout and CSS implement
  - WANG Yue:
    - chrome extension development, set up dev env
    - page rotater
  - LI Zhi:
    - page sizer
    - page rocker

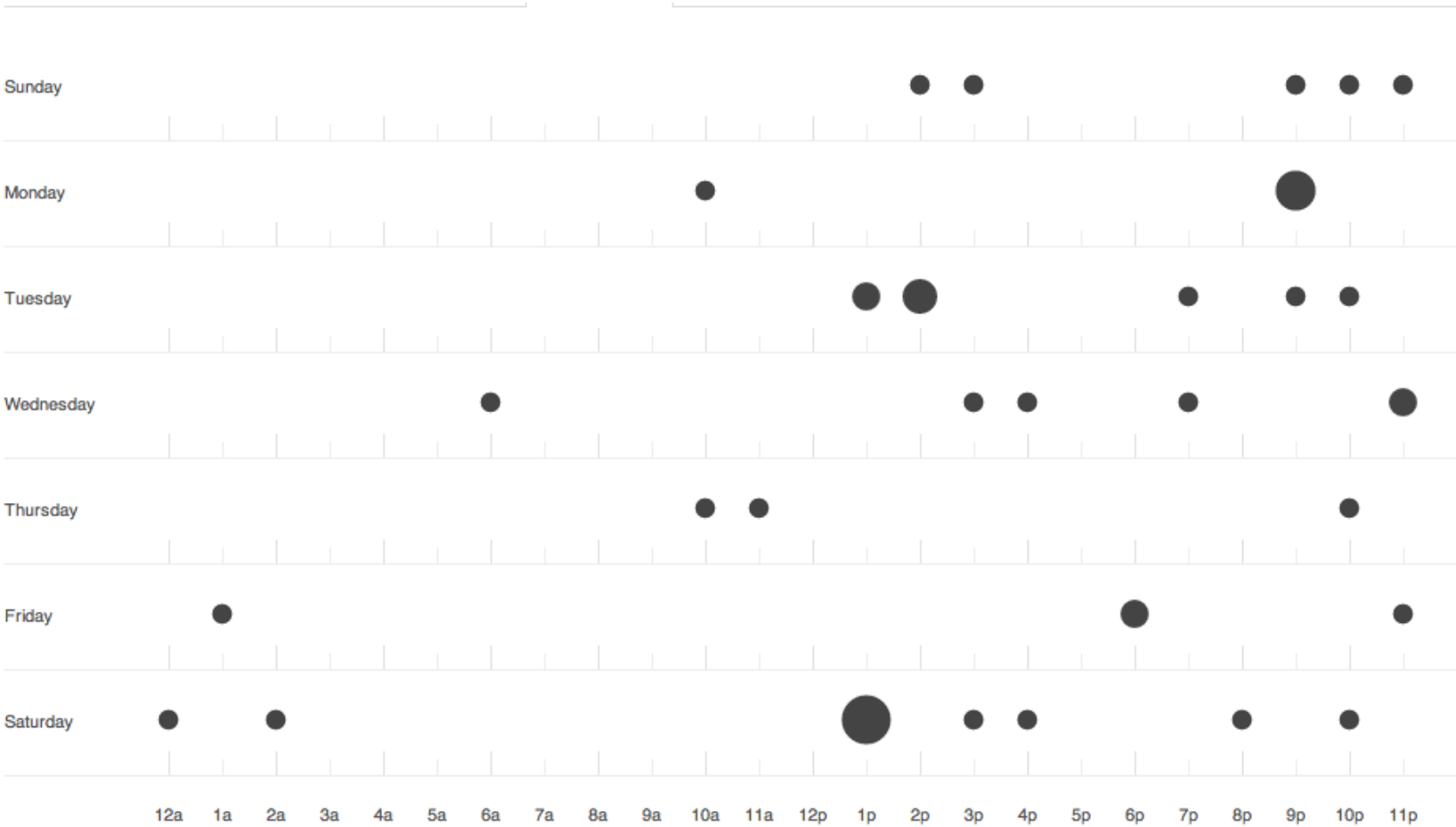

Figure : code commit frequency

Issue: What Probles We Have Met

How to keep states for each singal webpage seperately?

- write the extension states to global *window* object using code injection

How to load user local file from an chrome extension dynamically?

- due to security policy, not allowed in popup extension. Also using code injection, we can load user file dynamically. The request now if from the webpage we are browsing.

Generally we are not allowed to modify the original web page because it's offensive to users.

- Leave this problem to users, let them devide whether they trust us. But when the web site uses *https* protocol, we are denied.

Future Work

How can we improve the current version:

1. deploy *Rock Your Page* to Chrome Web Store
2. page sizer:
   - use vertical direction of head movement to control scroll bar
   - change between tabs using horizental movement
3. page rotater:
   - different ways to show multiple webpages
   - make controller more user friendly
4. page rocker:
   - involve more html elements
   - rock css improvement

Video Demo

Q&A