DR.SCRATCH'S DOCUMENTATION

Universidad
Rey Juan Carlos

2014/2015

Our passion is our strength.

II

Contents

1 Getting started with Dr.Scratch **1**

1.1 The beginning 1

1.2 Always improving 5

2 How Dr.Scratch was implemented? **9**

2.1 Hairball 10

2.2 Django 10

2.2.1 Urls 10

2.2.2 Views 10

2.2.3 Models 10

2.2.4 Internationalization 10

3 Dr.Scratch in production **11**

3.1 Apache 11

List of Figures

1.1 Downloading a project from Scratch to your computer. 2
1.2 First Appearance of Dr.Scratch. 3
1.3 First Dashboard of Dr.Scratch. 4
1.4 Second Appearance of Dr.Scratch. 6
1.5 Section 'Why?' of Dr.Scratch's web. 7
1.6 Section 'How?' of Dr.Scratch's web. 7
1.7 Section 'Working on' of Dr.Scratch's web. 8
1.8 Section 'Contact us' of Dr.Scratch's web. 8

Chapter 1

Getting started with Dr.Scratch

1.1 The beginning

' Dr.Scratch is a web application to analyze your own (or their students) Scratch projects. Feedback is given in a variety of areas Computational Thinking. That way, you or your students can be able to learn and improve your programming skills.'

To begin with, we want to show the evolution of Dr.Scratch and how it works without going into technical details. The reason of this is we would like have a view of our errors at the beginning and how we did solve thank to the feedback of our users. Dr.Scratch begins as a simple idea, correct bad habits that many students can acquire programming. Is being introduced the Scratch environment as a tool to teach programming skills or develop computational thinking is increasingly common in all levels of education and Dr.Scratch tries to help in this mission. At first, we thought about the Scratch projects which you can download from Scratch web how the Figure 1.1 shows. It allows you to have your project in your own computer and upload it to Dr.Scratch to be analyzing.

The first appearance that we designed was very simple to use this option and it helped us to implement the functionality of upload of file and analysis. You can take a look at the Figure 1.2 shows.

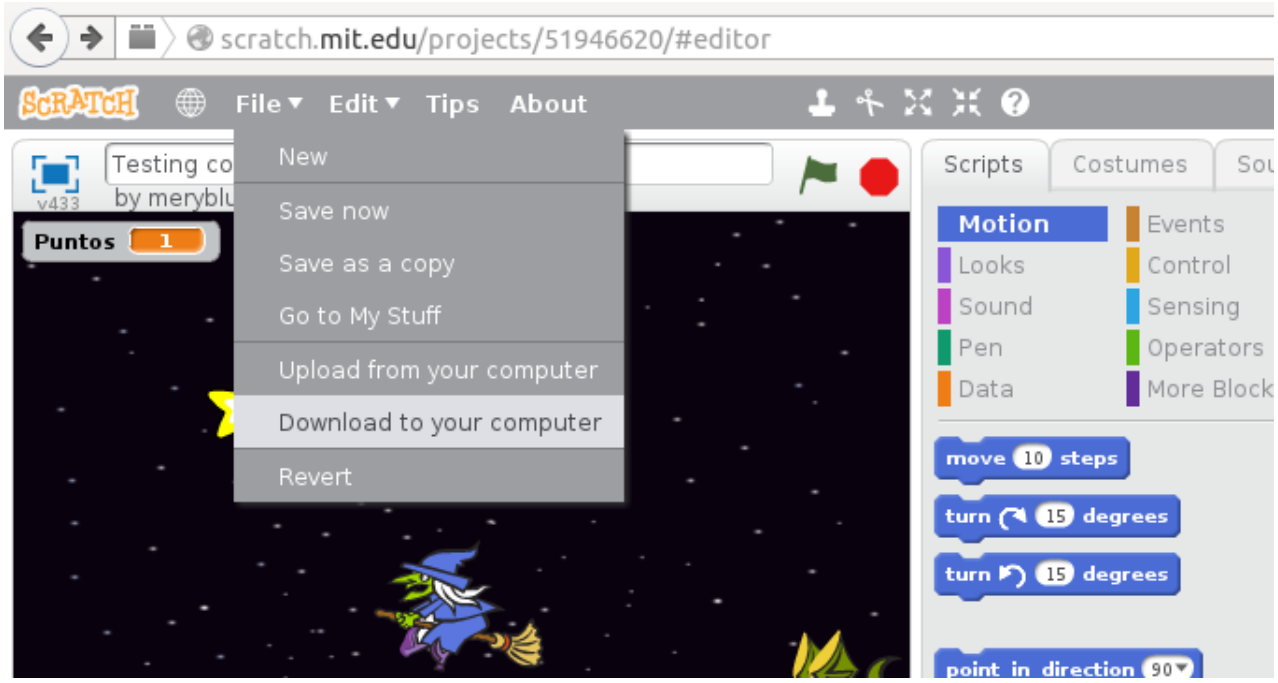

Figure 1.1: Downloading a project from Scratch to your computer.

You could choose a file (previously downloaded from Scratch), click " Send " to analyze and find code smells with the information provided on the dashboard that Dr.Scratch showed after a few seconds. Also you had got extra information:

- A demo video explaining how to use Dr.Scratch to improve your programming skills.
- A contact section where you could find our e-mail and twitter to write us if you wanted.
- The new features that we wanted to develop in that moment.
- The posibility to sign in on the top.

When you clicked on "Send" Dr.Scratch uploaded your project to our server without to save any additional information. After that, we used and still use some plug-ins (which will be described later) to analyze the project and showed the dashboard you can see in the Figure 1.3.

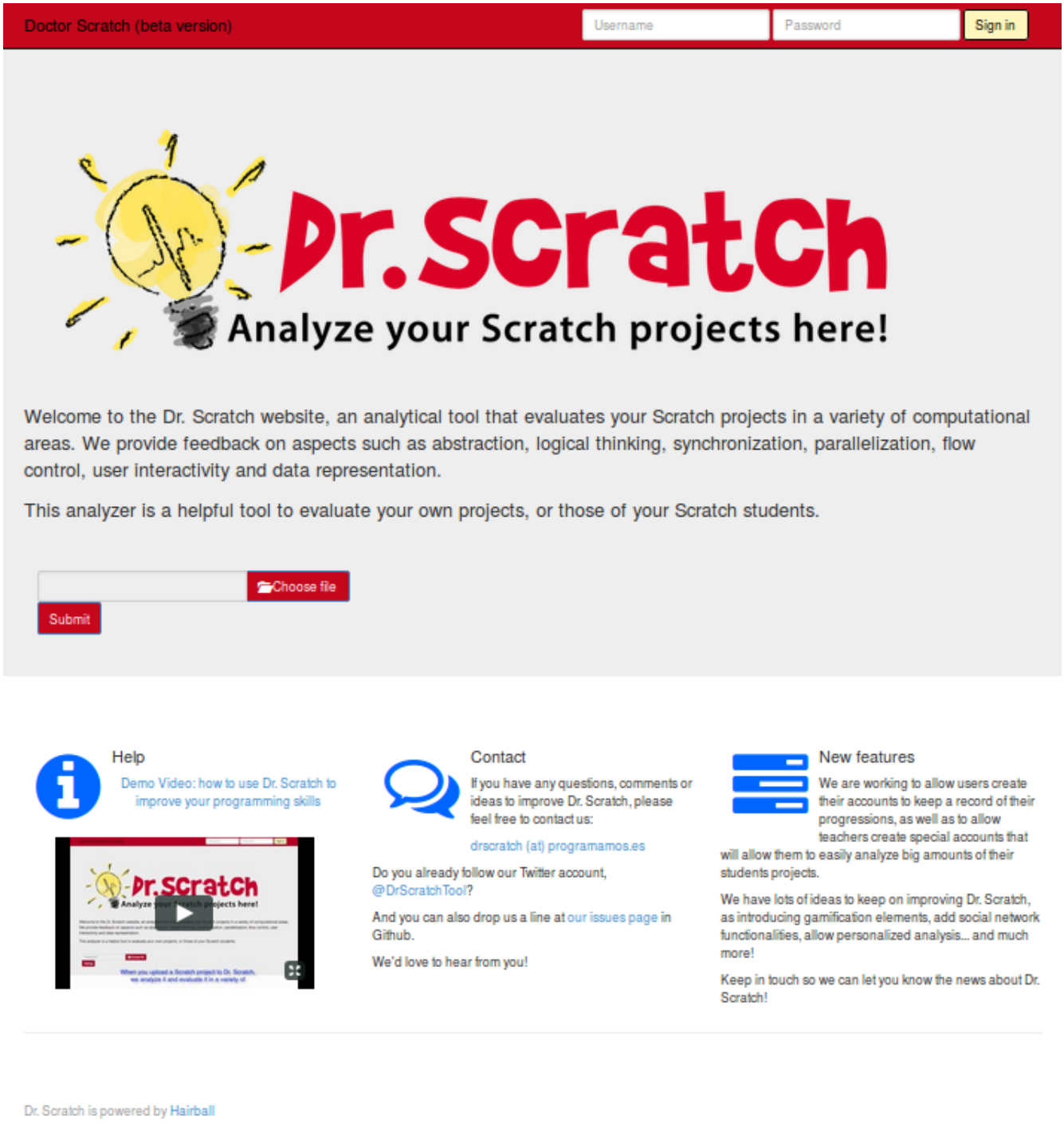

Figure 1.2: First Appearance of Dr.Scratch.

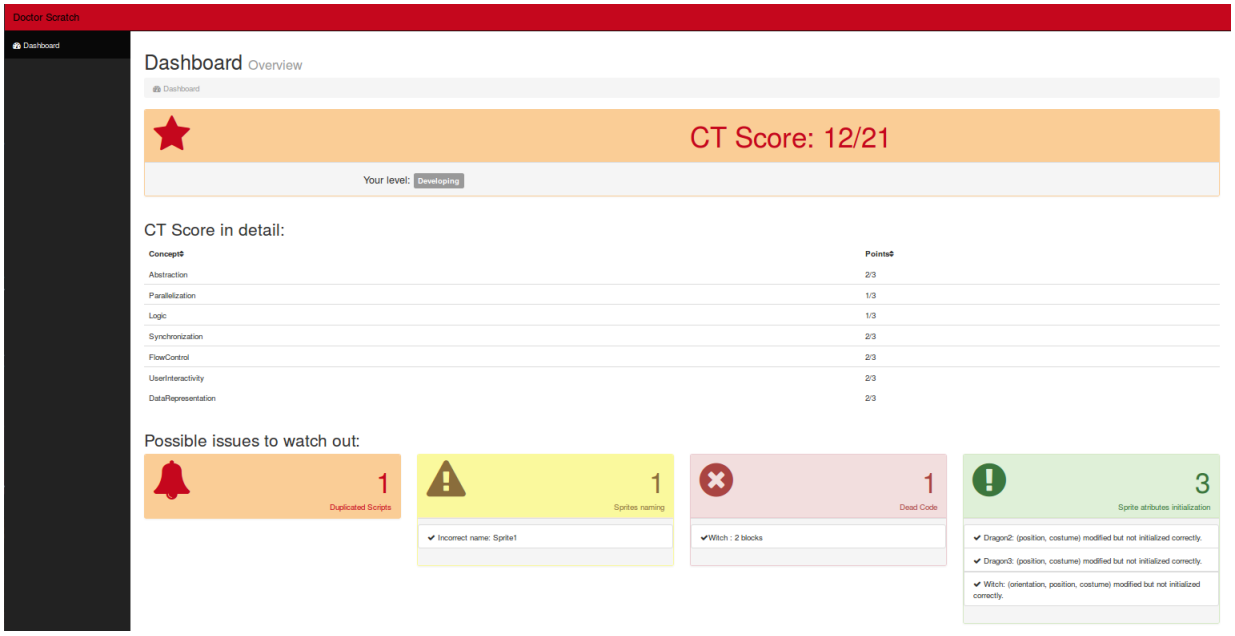

Figure 1.3: First Dashboard of Dr.Scratch.

The dashboard gives you information in detail about several aspects which are related to Computational Thinking like:

- Logic
- Abstraction
- Parallelization
- Synchronization
- Flow Control
- User Interactivity
- Data Representation

In accordance with these aspects, your project will have a score that is showed in the top with the title “CT Score” and gives you a idea about your level. The other information provided tells about those habits which some programmers can acquire when starts in this world. We have started with four of these bad habits:

1. Duplicated scripts
2. Sprite naming
3. Dead code
4. Sprite attributes initialization

This appearance was in production since November of 2014 until March of 2015. Although it was very simple, had high acceptance. We reckon this was the reason of his successful. But we have a long way to go, in fact, we are including new features and appearances trying to get close to the final product. These new features and appearances will be described in the following section explaining why we thought it was a good idea add it.

1.2 Always improving

' At that moment, Dr.Scratch is a beta version and we're incluiding new features.'

The first feature we wanted to include was the analyzing by the url provided by Scratch because it was demanded us by many users. They didn't want to have to donwload their projects in their own computers and later use Dr.Scratch. At the same time, we decided to change de appearance of the main page trying to catch the atention of more amount of users. Then using bootstrap we did the web which you can see in the Figure 1.4.

We chose this appearance because it shows the soul of Dr.Scratch: many people are working and learning together, sharing their work to get better projects.

There is a summary for introduce Dr.Scratch to new users and the two ways to analyze your Scratch projects.

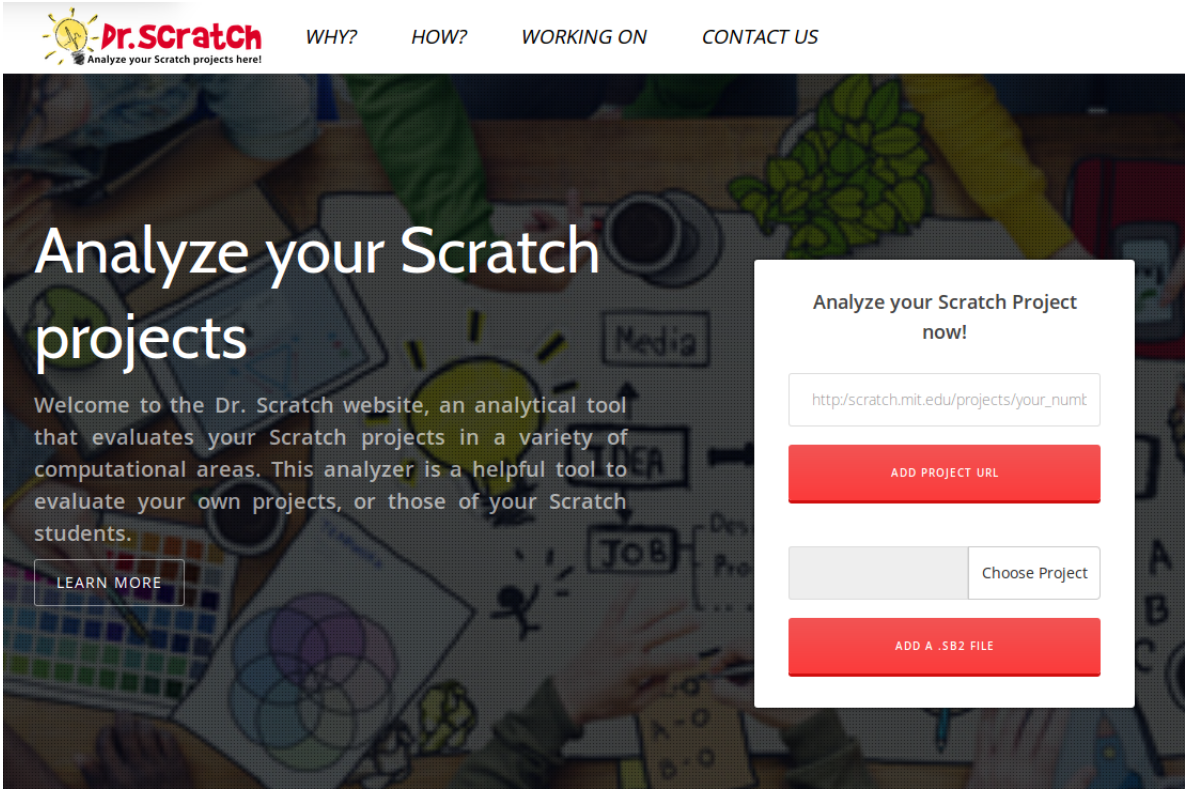

Figure 1.4: Second Appearance of Dr.Scratch.

This web has several sections where you can read information about Dr.Scratch:

1. Why?
2. Who?
3. Working on
4. Contact us

You can select a section from the top navigation bar to read more. When you click on them you could see the following views that are showing in the Figures: 1.5, 1.6, 1.7 and 1.8

Nowadays we're working on three new dashboards where you could see the information acording your level of Computational Thinking.

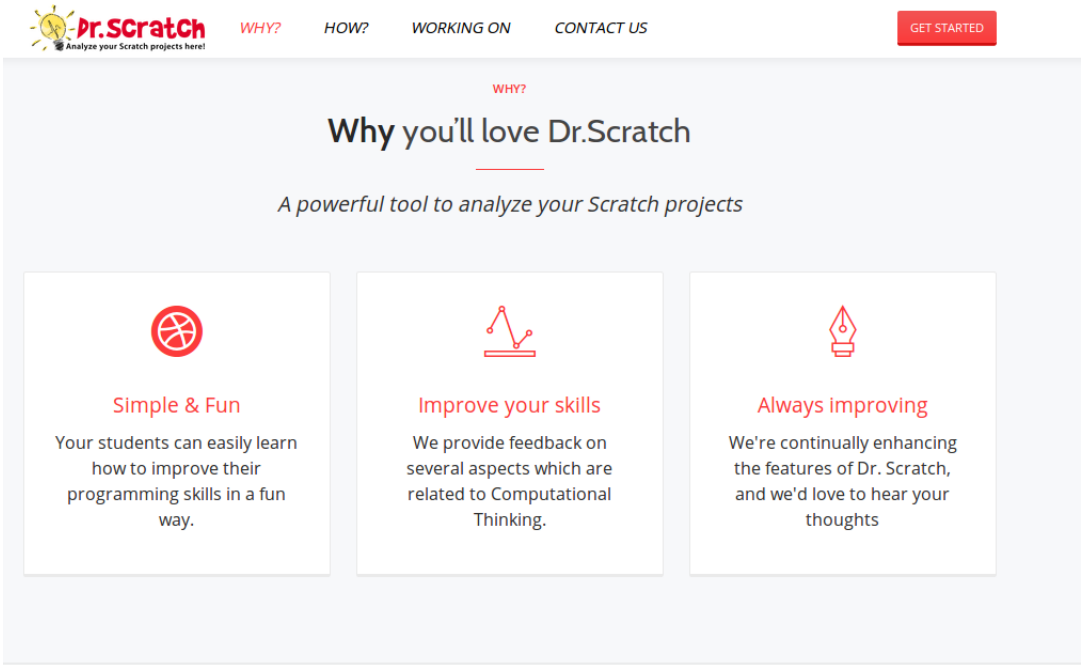

Figure 1.5: Section 'Why?' of Dr.Scratch's web.

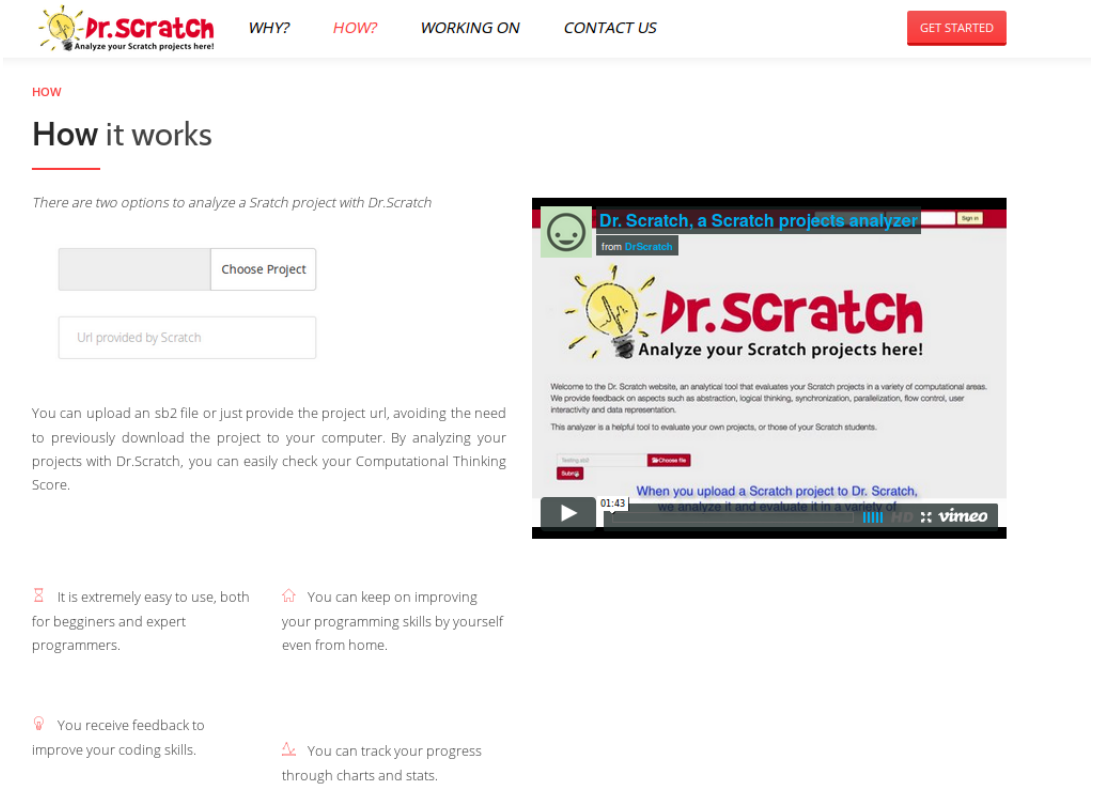

Figure 1.6: Section 'How?' of Dr.Scratch's web.

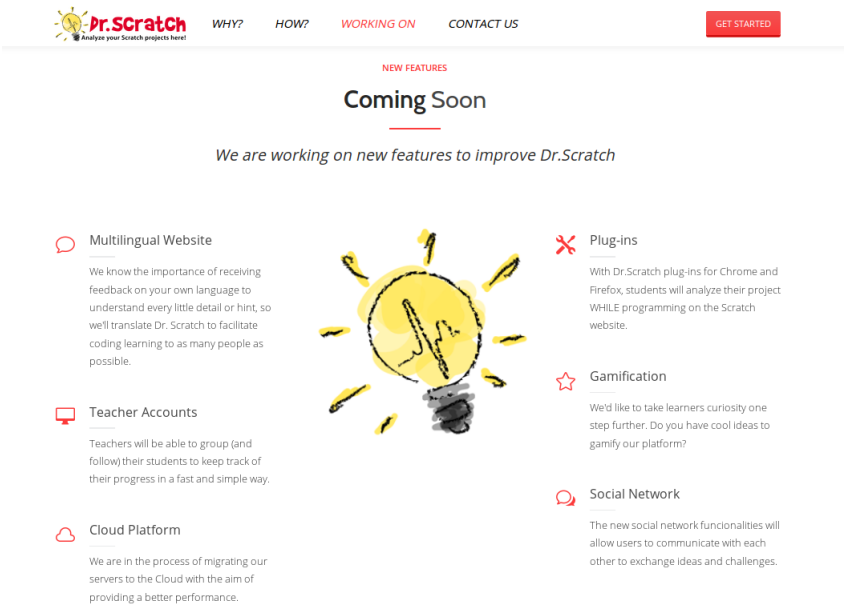

Figure 1.7: Section 'Working on' of Dr.Scratch's web.

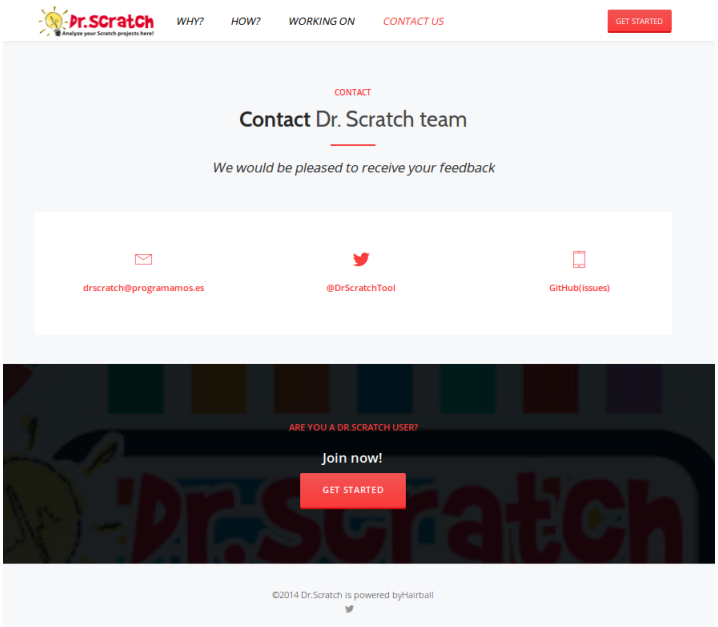

Figure 1.8: Section 'Contact us' of Dr.Scratch's web.

Chapter 2

How Dr.Scratch was implemented?

'Dr.Scratch powered thanks to several modules interconected each other.'

Como la mayoria de las aplicaciones, Dr.Scratch es un conjunto de modulos interconectados entre si. Pero podemos simplificarlos en tres principalmente:

- Hairball: plug-in encargado de analizar los projectos de Scratch que son subidos a Dr.Scratch y es el modulo que se encarga de decidir las notas de dichos proyectos en una variedad amplia de aspectos referentes al pensamiento computacional.

- Django: framework de programacion para generacion servidores con Python, donde esta el nucleo de nuestra web.

- Bootstrap: framework de css que nos permite mostrar la web con un aspecto muy profesional. Se encarga de organizar y dar prioridad a los distintos ficheros css, JavaScript, fonts... de los que consta nuesta aplicacion.

En las siguientes secciones los vamos a ver en mayor detalle, indicando donde hemos tenido mayores dificultades y la forma de resolverlas.

2.1 Hairball

2.2 Django

2.2.1 Urls

2.2.2 Views

2.2.3 Models

2.2.4 Internationalization

Chapter 3

Dr.Scratch in production

3.1 Apache and mod_wsgi to Django

You must to have an server over your aplication to do this multithread. We chose Apache as our license because is easy to implemente with Django throw a module called mod_wsgi.

We aren't using Virtualenv because all of us use the same version then we don't need this.

The steps followed to install Apache with mod_wsgi to Django were:

1. You can download Apache from: http://httpd.apache.org/docs/2.0/es/install.html
2. Install it following the steps indicated in the web.
3. Install mod_wsgi.
4. Configure Apache changing the file httpd.conf

Some tricks:

-