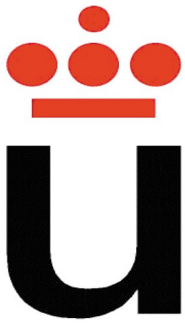
Dr. Scratch

Automatic analysis of Scratch projects to assess the development of CT

Scratch Conference, Boston 2014

Jesús Moreno, Gregorio Robles, Cristian Chusig



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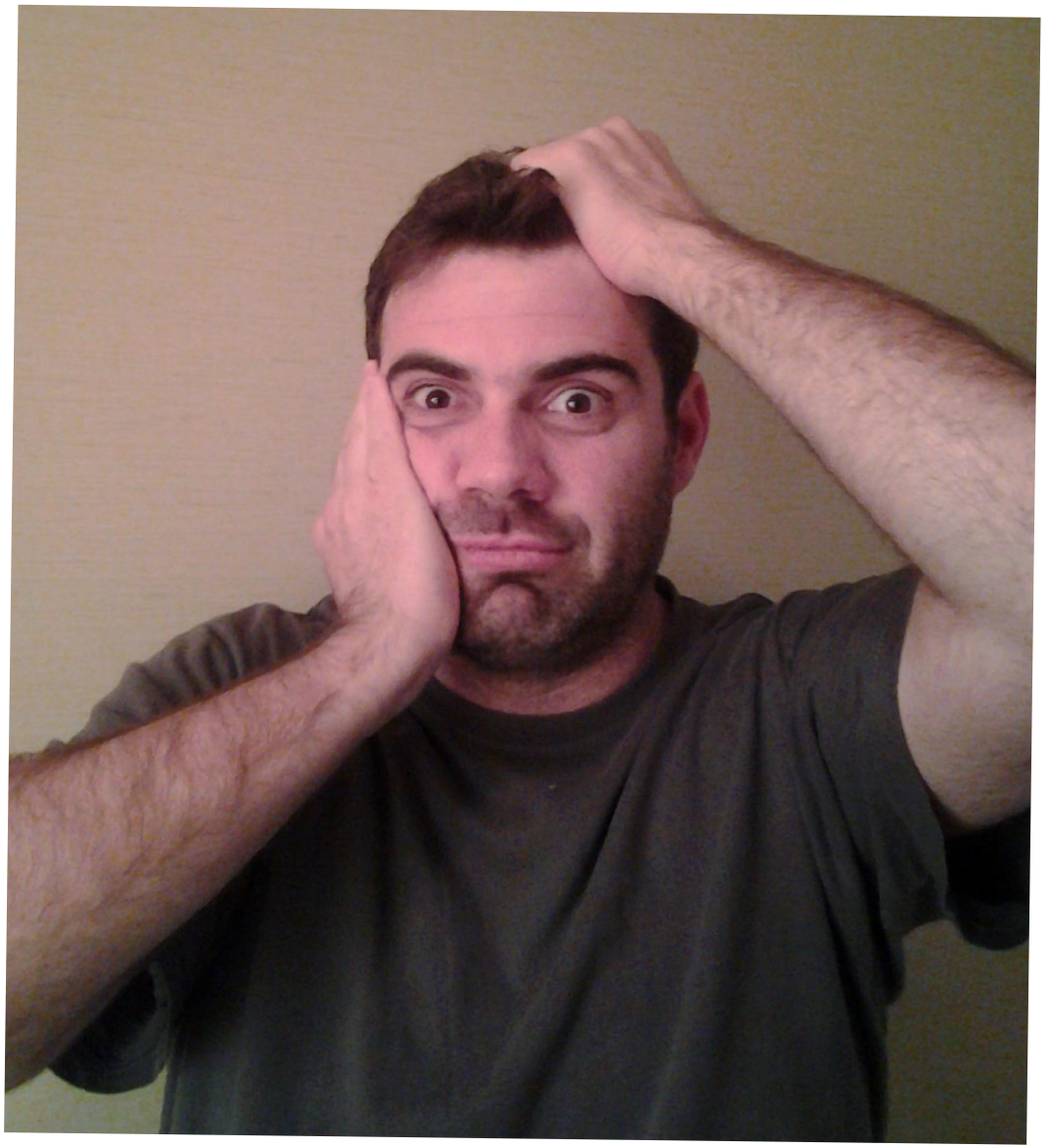
Why automatic analysis?

Why automatic analysis?



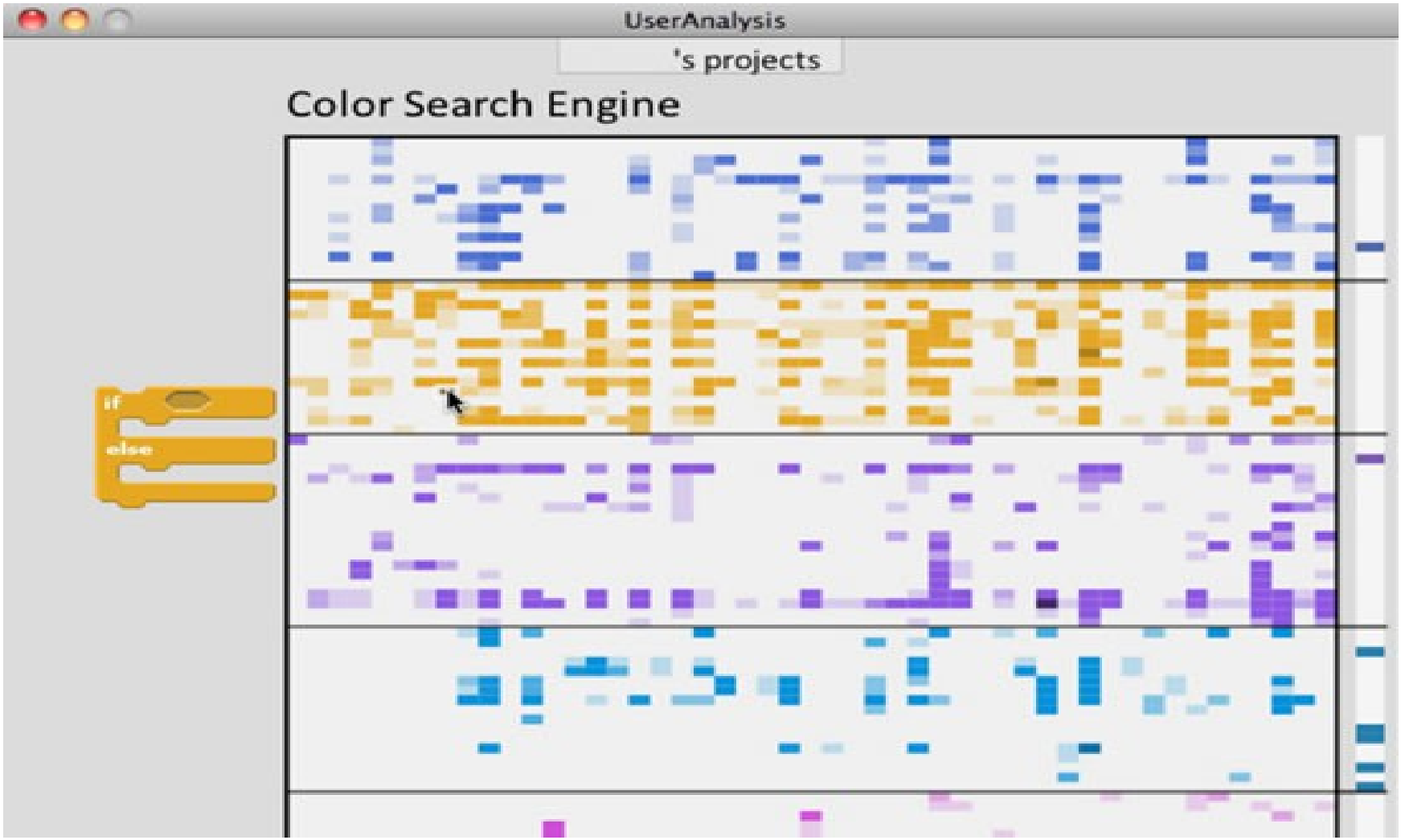
Why automatic analysis?


```
Global evaluation
-----------------
Your code has been rated at 9.41/10

Raw metrics
-----------

+----------+-------+------+---------+-----------+
|type      |number |%     |previous |difference |
+==========+=======+======+=========+===========+
|code      |115    |64.61 |NC       |NC         |
+----------+-------+------+---------+-----------+
|docstring |40     |22.47 |NC       |NC         |
+----------+-------+------+---------+-----------+
|comment   |4      |2.25  |NC       |NC         |
+----------+-------+------+---------+-----------+
|empty     |19     |10.67 |NC       |NC         |
+----------+-------+------+---------+-----------+
```

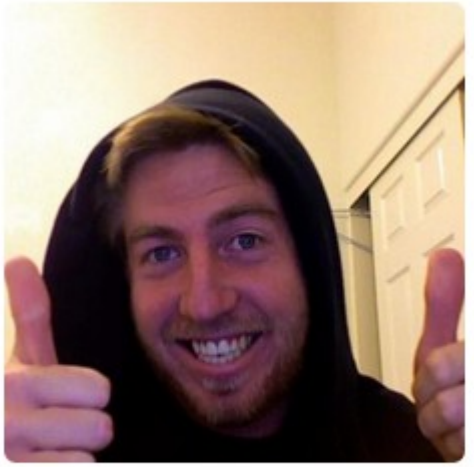
Scrape



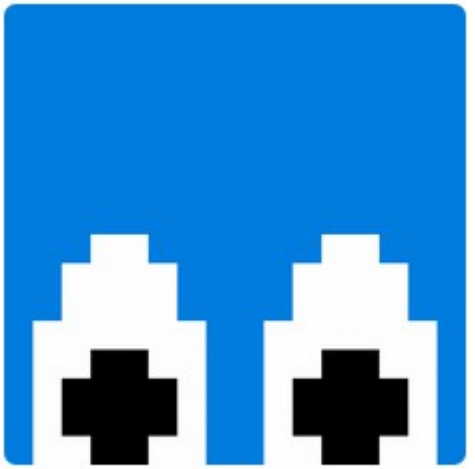
http://happyanalyzing.com/

Hairball

- **Hairball**
  - A plugin-able framework for static analysis of Scratch projects.
  - https://github.com/ucsb-cs-education/hairball
- **Kurt**
  - A library which allows complex manipulation os Scratch project files via simple Python commands.
  - https://github.com/blob8108/kurtc



Bryce Boe
bboe



blob8108

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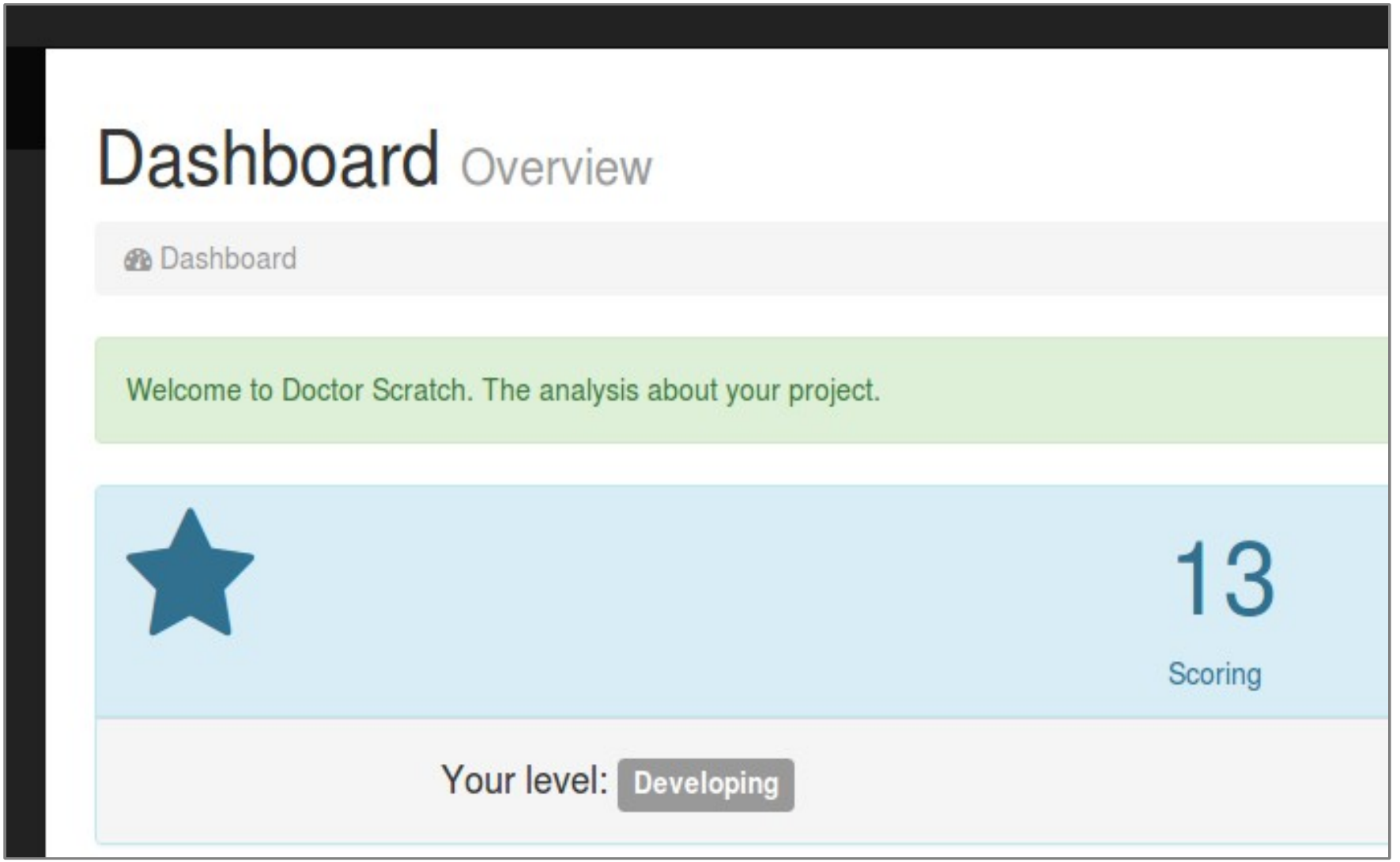
Dashboard Overview
Dashboard
Welcome to Doctor Scratch. The analysis about your project.
13
Scoring
Your level: Developing

Dr. Scratch

CT Score in detail:

Concept	Points
CT global score	12
Abstraction	2
Parallelization	1
Logic	1
Synchronization	2
FlowControl	2
UserInteractivity	2
DataRepresentation	2

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CT concept	Basic	Developing	Proficiency
Parallelization	2 scripts on green_flag	2 scripts on key_pressed, 2 scripts on sprite_clicked on the same sprite	2 scripts on when_I_recieve_message, create_clone, 2 scripts when_%s_is_>_%s, 2 scripts on when_backdrop_change_to
Synchronization	wait	Broadcast, when_I_receive_message, stop_all, stop_program,stop_programs_sprite	wait_until, when_backdrop_change_to, when_I_start_as_clon, broadcast_and_wait
Data representation	Modifiers of properties of sprites	Operations on vars	Operations on lists
Conditional logic	if	if_else	logic operations
Interactivity (UI)	Green_flag	key_pressed, sprite_clicked, ask_and_wait, mouse blocks	when_%s_is_>_%s, video, audio
Algorithmic notions of flow control	Sequence of blocks	Repeat, Forever	repeat_until
Abstraction and problem decomposition	> 1 scripts	> 1 scripts and > 1 sprites	def_block

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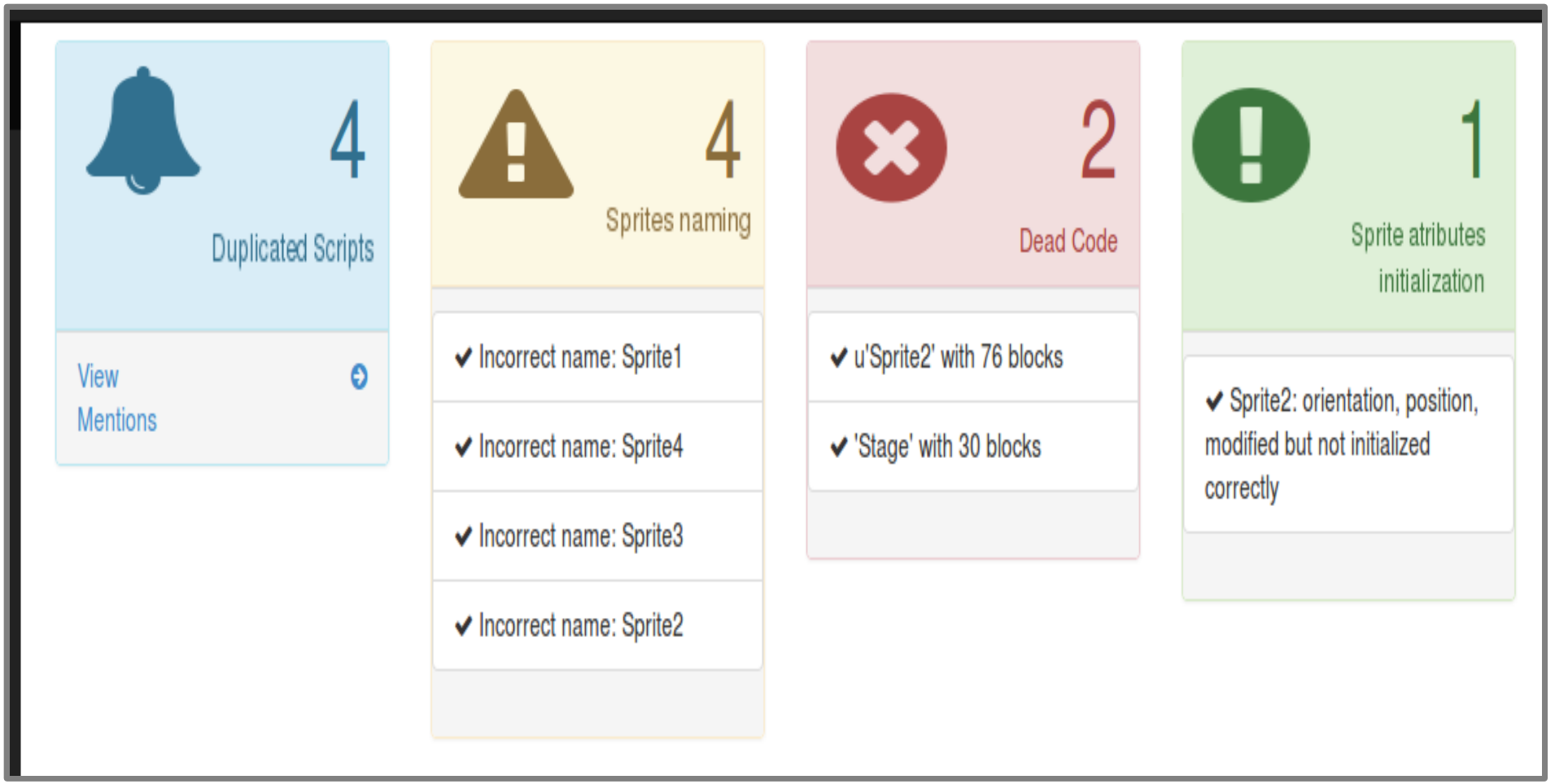

(Not available in the alpha version online)

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- Bugs:
  - Dead code
  - Messages
  - Attributes initialization
- Issues:
  - Code repetition
  - Sprite naming

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when clicked
hide
forever
if touching Sprite14 ? then
go to Sprite12
show
when clicked
hide
forever
if touching Sprite14 ? then
go to Sprit
show
mouse-pointer
edge
Sprite10
Sprite11
Sprite12
Sprite13
Sprite14
Sprite2
Sprite24
Sprite25
Sprite26
Sprite27
Sprite28
Sprite29
Sprite3
Sprite30
Sprite31
Sprite32
Sprite34
Sprite35
Sprite36
Sprite37
Sprite38
Sprites
New sprite:
Sprite1
Sprite14
Sprite11
Sprite10
Sprite24
Sprite25
Sprite26
Sprite27
Sprite28
Sprite29
Sprite30
Sprite31
Sprite34
Sprite35
Sprite36
Sprite37
Sprite38
Sprite32
Sprite40
Sprite41
Sprite2
Sprite3
Sprite4
Sprite5
Sprite6
Sprite7
Sprite8
Sprite9
Sprite12
Sprite13

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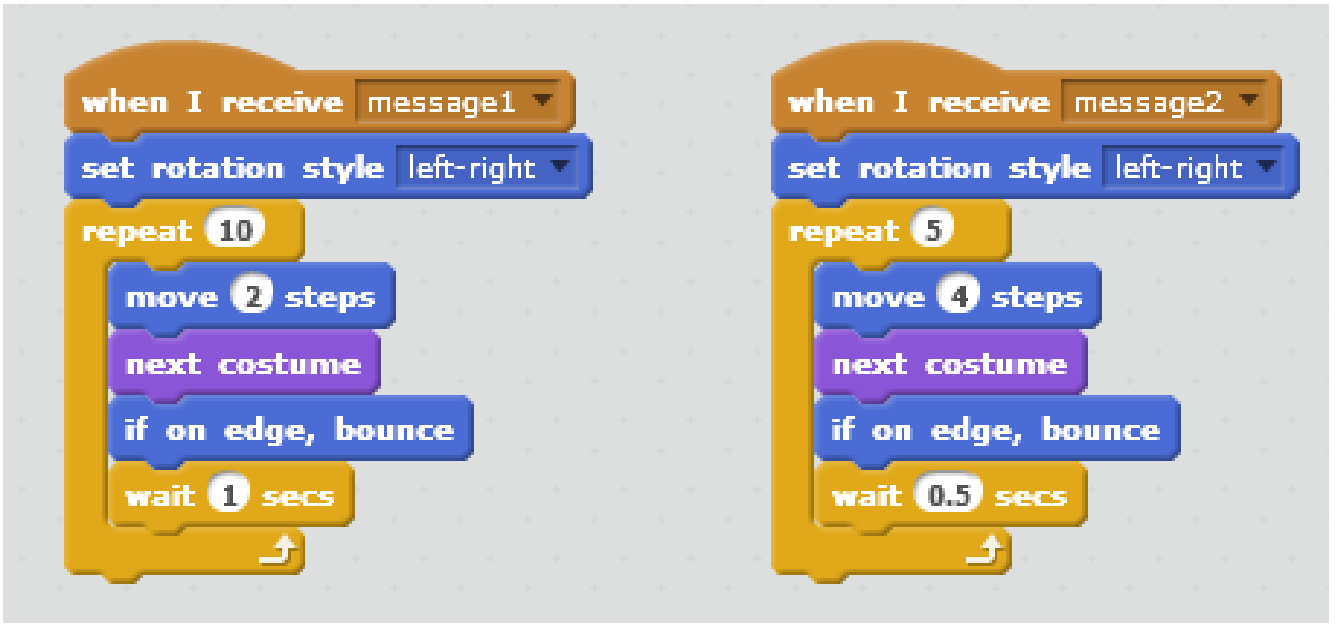
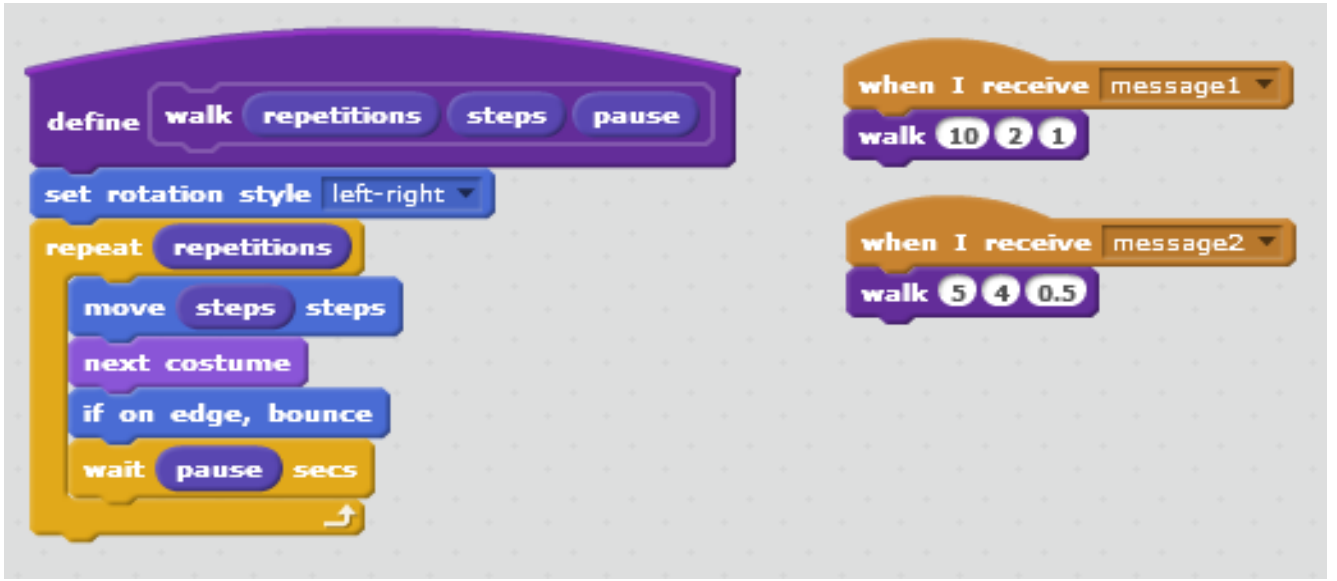

when I receive message1
set rotation style left-right
repeat 10
move 2 steps
next costume
if on edge, bounce
wait 1 secs
when I receive message2
set rotation style left-right
repeat 5
move 4 steps
next costume
if on edge, bounce
wait 0.5 secs


define walk repetitions steps pause
set rotation style left-right
repeat repetitions
move steps steps
next costume
if on edge, bounce
wait pause secs
when I receive message1
walk 10 2 1
when I receive message2
walk 5 4 0.5

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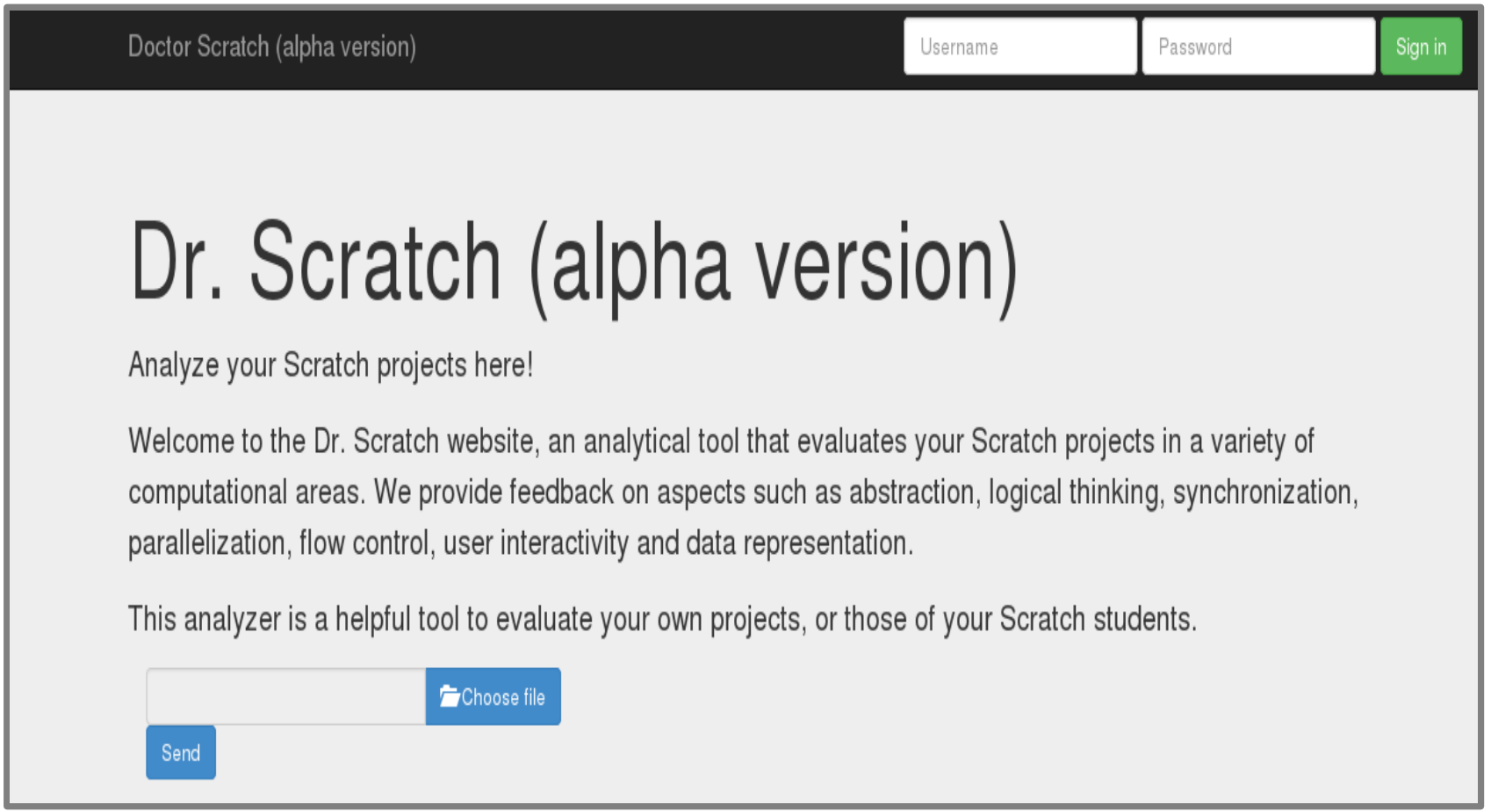
http://drscratch.programamos.es



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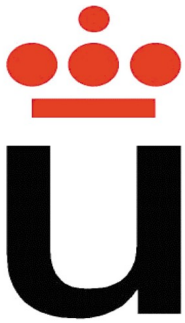

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