

Manual annotations of SMB scenes : Pattern analysis

following <https://doi.org/10.1145/2427116.2427117>
Using maps from <https://nesmaps.com/maps/SuperMarioBrothers/SuperMarioBrothers.html>

Level segmentation procedure - setting up the env

- 1- Create a virtual env
- 2- Install stable-retro following the [dev installation guide](#)
- 3- Clone [mario dataset](#) + [mario.stimuli](#) through datalad
- 4- To have access to the spreadsheet with all the values regarding the segmentation:
 - 1- Go inside the mario directory
 - 2- Make sure to be using the [events branch](#): `git checkout events`
 - 3- `cd code/scenes/`
 - 4- open and edit scenes_mastersheet.csv (see next slide)

Level segmentation procedure - doing the thing !

5- Proceed to the segmentation of the level in this GSlides

6- For every segmented scene, annotate the content based on the different game patterns as defined in Table 1 of [Dahlskog & Togelius \(2012\)](#)

7- Add the info about the content of the scene in the scenes_mastersheet.csv

8- To get the Entry point and the Exit point of the scene:

1- Open the GUI: `cd stable-retro` and `./gym-retro-integration`

2- Load game (select the rom.nes file in the mario.stimuli/SuperMarioBros-Nes directory)

3- Load state... Use to select a specific state/level

4- To see the value: Window/Show scenario info... in the GUI

5- Look for: level_layout; player_x_posHi; player_x_posLo

6- To get the actual value for Entry/Exit point: $\text{player_x_posHi} * 256 + \text{player_x_posLo}$

Level annotation procedure - validating the thing !

To make sure the annotations make sense for all the segmented scenes, one proposition is to visualize the gameplays across trials and participants for each scene.

1- Make sure you ran `datalad get sub*/ses*/func/*event*` and `datalad get sub*/ses*/gamelogs/*bk2`

2- Run the clip_extractor.py script to segment the gameplays in scene:

```
python clip_extractor.py --datapath <path_to_bids_dataset> --output <path_to_save_outputs> --clip_extension mp4
```

3- Check if the annotations we have done bellow watch what is happening in the scenes. Add your observation to this google slides for each corresponding level

w1l1

Scene 0 :
- Beginning

Scene 1 :
- Enemy
- 2-path
- Risk/reward
- Roof

Scene 2 :
- Empty valley

Scene 3 :
- Enemy valley
- Enemy

Scene 4 :
- Enemy valley
- 2-hord

Scene 5 :
- Gap
- 2-path

Scene 6 :
- 3-path
- Risk/reward
- 2-hord

Scene 7 :
- Gap
- 3-path
- Risk/reward
- 2-hord

Scene 8 :
- 3-path
- Risk/reward
- 2-hord
- Enemy

Scene 9 :
- 3-path
- Risk/reward
- 4-horde

Scene 10 :
- Empty stair valley
- Stair up

Scene 11 :
- Gap stair valley

Scene 13 :
- 2-path
- 2-horde
- R/R
- Roof

Scene 14 :
- Stair up
- Flagpole

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WORLD 1-1

SUPER MARIO BROS.
©1985 NINTENDO

===== LEGEND =====

Coin

Magic Mushroom or Fire Flower

Starman

1 up Mushroom

Little Goomba

Koopa Troopa

Scene 12 :
- Reward

w1l2

Scene 0 :

- 2-hord
- 2-path
- Risk-reward

Scene 1 :

- Enemy stair valley
- 2-path
- Risk-reward

Scene 2 :

- 2-hord
- 2-path
- Risk-reward
- Roof

Scene 3 :

- 3-hord
- Reward
- Roof

Scene 4 :

- Enemy
- 2-hord
- 3-path
- Risk-reward
- Roof

Scene 5 :

- Gap
- 2-path
- Reward

Scene 6 :

- 3-hord
- Enemy valley
- Pipe valley

Scene 8 :

- Pillar gap

Scene 9 :

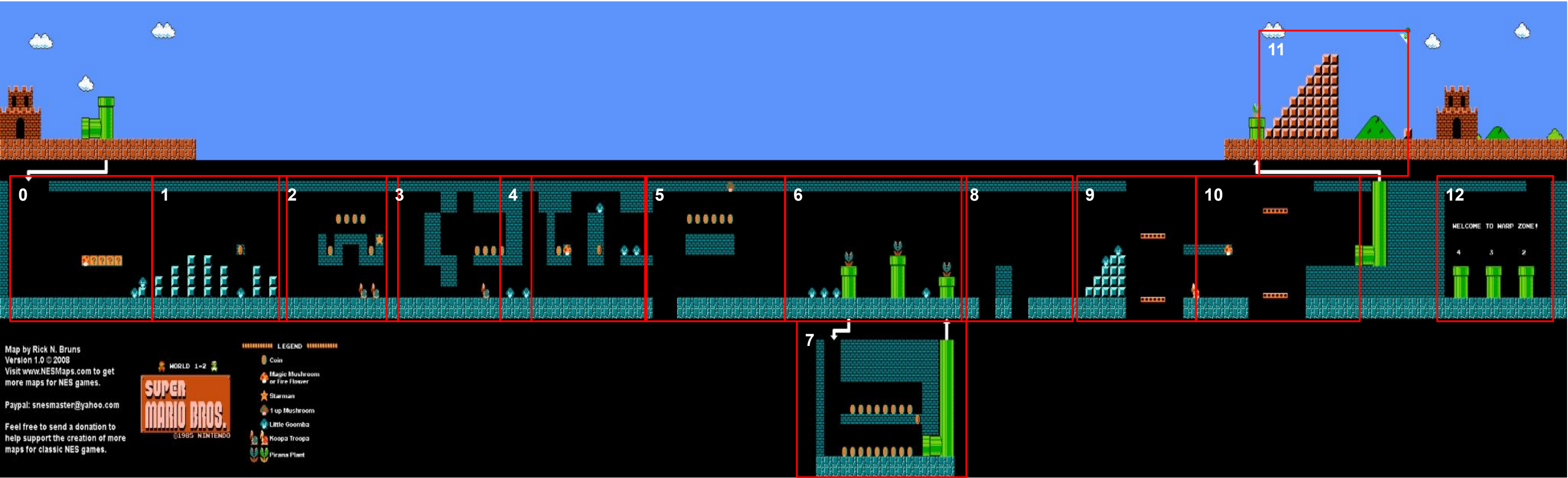
- Stair up
- 2-hord
- Enemy
- 2-path
- Gap
- Moving platform

Scene 10 :

- Risk/Reward
- Gap
- Moving platform
- Roof

Scene 11 :

- Stair up
- Flagpole

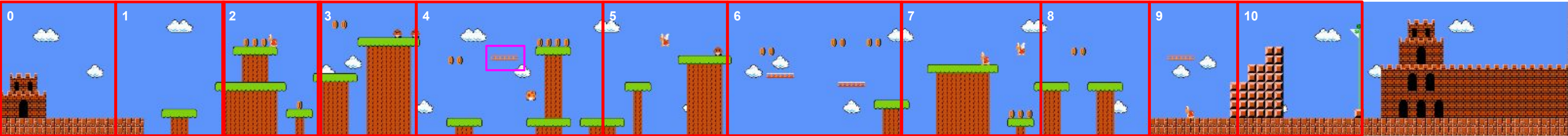


Scene 7 :

- Reward

w1l3

0	1	2	3	4	5	6	7	8	9	10
- Beginning	- Variable gaps	- 2-Path - Enemy - Variable gaps	- 2-horde - Gap	- Variable gaps - 2-path - Moving platform - Risk/Reward	- Variable gaps - 2-path - Gap enemy	- Variable gaps - Moving platform	- Variable gaps - 2-horde - Gap enemy	- Multiple gaps	- Moving platform - Enemy	- Stair up - Flagpole



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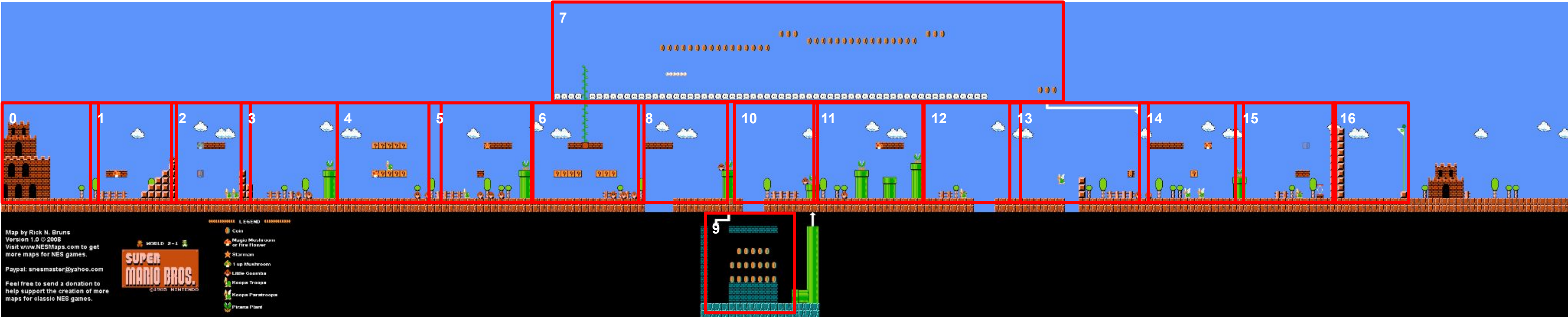
WORLD 1-3

LEGEND

- Coin
- Magic Mushroom or Fire Flower
- Little Goomba
- Koopa Troopa
- Koopa Paratroopa

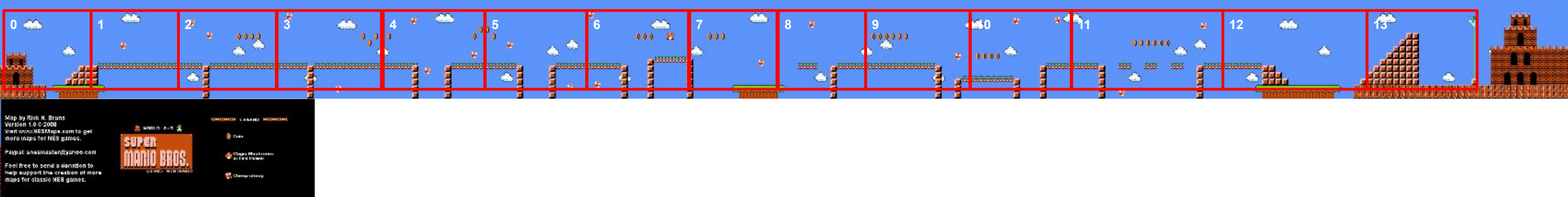
w2l1

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
- Beginning	- 2-path - Stairs up - Roof	- 2-path - 2-hord - Risk/Reward - Enemy stairs valley	- Enemy valley - 2-hord	- 2-hord - 3-path - Risk/Reward - Enemy Roof	- 3-hord - 2-path - Risk/Reward	- 3-hord - 3-path - Roof	- Bonus zone - Moving platform	- 2-path - enemy - gap	- bonus zone	- Gap - enemy	- Enemy valley - Empty valley - 2-path - Risk/Reward	- gap - enemy	- gap - enemy	- 4-hord - 2-path - risk/reward	- enemy - 2-path - roof	- flagpole



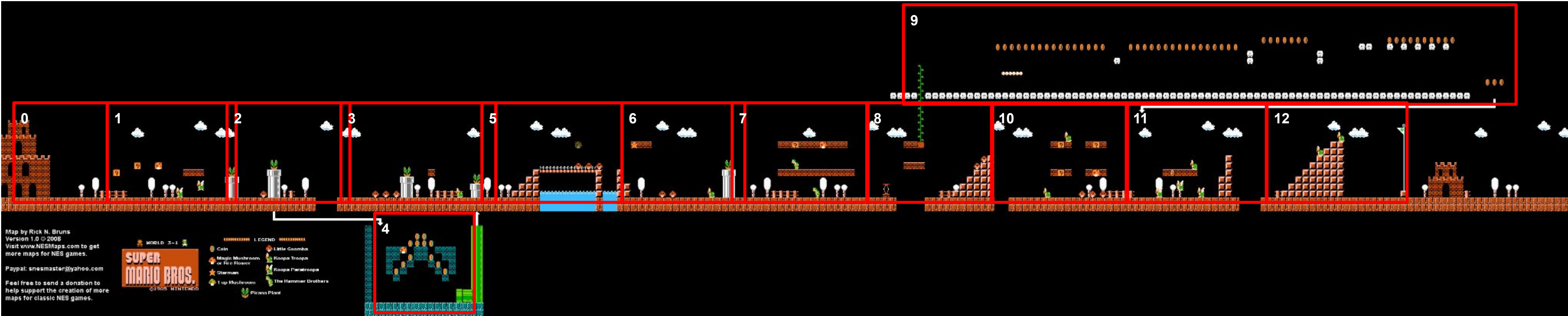
w2l3

0	1	2	3	4	5	6	7	8	9	10	11	12	13
<ul style="list-style-type: none">- Beginning- Stair up- Gap	<ul style="list-style-type: none">- Enemy	<ul style="list-style-type: none">- Enemy	<ul style="list-style-type: none">- Enemy	<ul style="list-style-type: none">- Gap enemy	<ul style="list-style-type: none">- Gap enemy	<ul style="list-style-type: none">- Gap enemy- Risk/Reward	<ul style="list-style-type: none">- Gap enemy	<ul style="list-style-type: none">- Gap enemy- Variable gaps	<ul style="list-style-type: none">- Gap enemy	<ul style="list-style-type: none">- Gap enemy	<ul style="list-style-type: none">- Gap enemy- Multiple gaps	<ul style="list-style-type: none">- Gap enemy- Stairs down	<ul style="list-style-type: none">- Stairs up- Flagpole

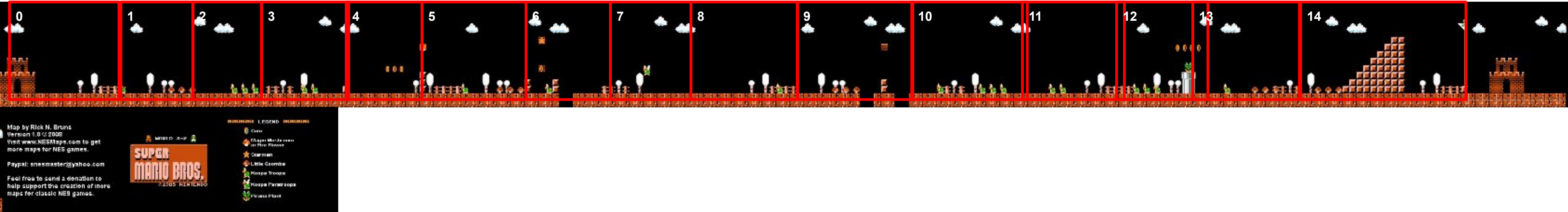


w3l1

0	1	2	3	4	5	6	7	8	9	10	11	12
<div>- Beginning</div>	<div><div>- 2-hord</div><div>- Risk/reward</div><div>- Roof</div><div>- 2 path</div></div>	<div><div>- Enemy valley</div><div>- Gap</div></div>	<div><div>- 3-hord enemy valley</div><div>- Roof</div><div>- 2-path</div></div>	<div><div>- Bonus zone</div></div>	<div><div>- stairs up</div><div>- 3-hord</div><div>- gap</div><div>- risk/reward</div></div>	<div><div>- 2-hord</div><div>- Enemy valley</div><div>- 2-path</div><div>- Risk/reward</div><div>- Stair down</div></div>	<div><div>- 3-path</div><div>- Risk/reward</div><div>- Enemy</div><div>- Roof</div></div>	<div><div>- 3-path</div><div>- Stairs up</div><div>- 2-hord</div><div>- Gap</div><div>- </div></div>	<div><div>- Bonus zone</div></div>	<div><div>- 3-hord</div><div>- Enemy</div><div>- 3-path</div><div>- Risk/reward</div><div>- Roof</div></div>	<div><div>- Roof</div><div>- Enemy</div><div>- 3-hord</div><div>- Gap</div></div>	<div><div>- 2-hord</div><div>- Stairs up</div><div>- Flagpole</div></div>

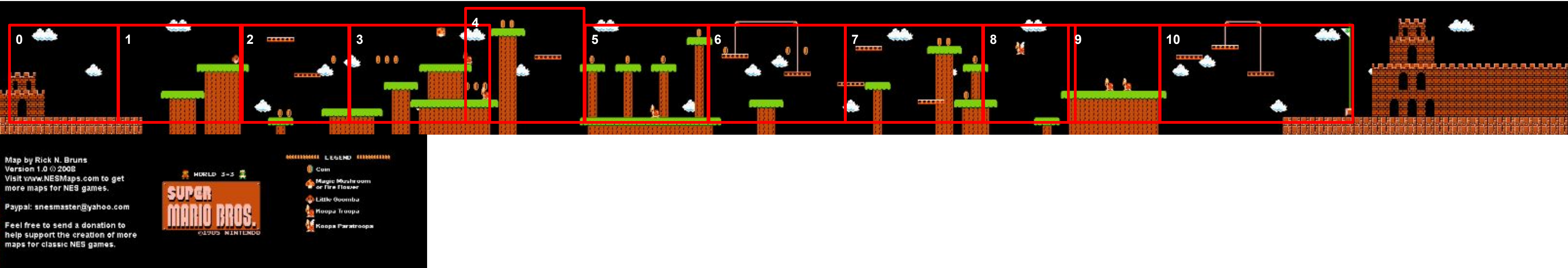


0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<ul style="list-style-type: none">- Beginni ng- Enemy	<ul style="list-style-type: none">- 3-hord	<ul style="list-style-type: none">- 3-hord	<ul style="list-style-type: none">- 2-hord	<ul style="list-style-type: none">- Empty valley	<ul style="list-style-type: none">- Risk/Re ward- Enemy valley- 3-hord-	<ul style="list-style-type: none">- Roof valley- Risk/Re ward gap	<ul style="list-style-type: none">- Enemy	<ul style="list-style-type: none">- Enemy	<ul style="list-style-type: none">- 3-hord- Multiple gaps	<ul style="list-style-type: none">- Enemy- 3-hord	<ul style="list-style-type: none">- 2-hord	<ul style="list-style-type: none">- 3-hord	<ul style="list-style-type: none">- Enemy- 3-hord	<ul style="list-style-type: none">- 3-hord- Stairs up- Flagpole



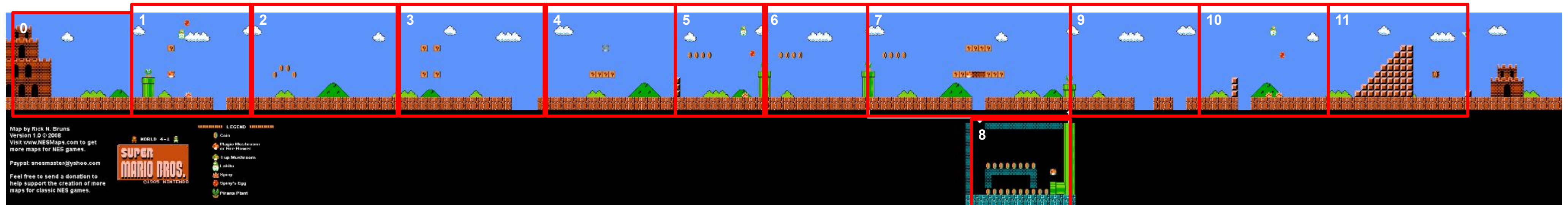
w3l3

0	1	2	3	4	5	6	7	8	9	10
- Beginning	- Gap - Enemy	- Moving platform - Variable gaps	- Gap - Risk/Reward - Enemy - 2-path	- Moving platform - gap	- Enemy - 2-path	- Moving platforms - Variable gaps	- Moving platforms - Variable gaps - 2-path	- Gap enemy	- 2-hord	- Moving platforms - Variable gaps - Flagpole



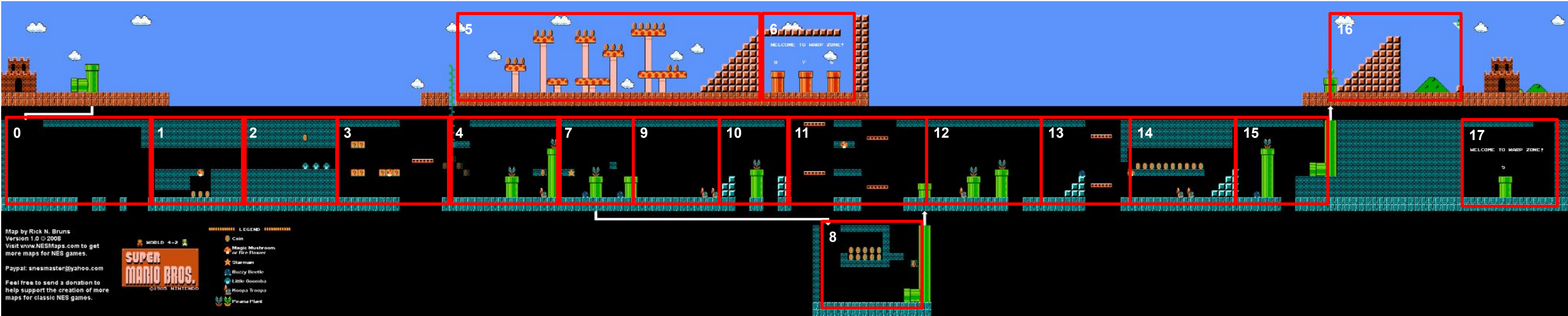
w4l1

0	1	2	3	4	5	6	7	8	9	10	11
- Beginning	- Enemy - Risk/Reward - gap	- Enemy	- enemy - gap -	- 2-path - risk/reward	- Enemy valley	- Pipe valley	- Gap - 3-path - Risk/reward - Enemy - Roof	- Bonus zone - Reward	- Variable gaps - Enemy	- Gap - enemy - 2-hord	- Stairs up - flagpole



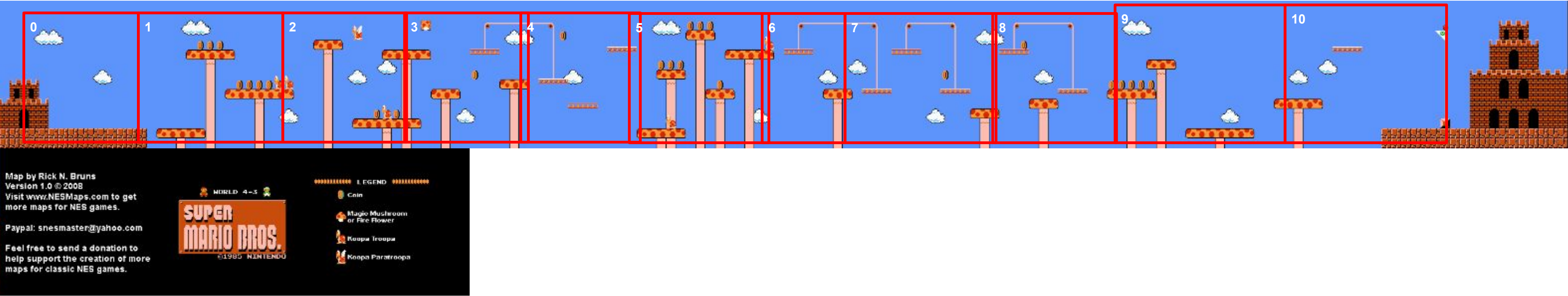
w4l2

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<ul style="list-style-type: none">- Beginning- Variable gaps	<ul style="list-style-type: none">- Reward	<ul style="list-style-type: none">- 3-hor d- roof	<ul style="list-style-type: none">- 2-pat h- Risk/Rewa rd- Movi ng platfo rm- Gap	<ul style="list-style-type: none">- Enem y valley- Roof valley- 2-pat h	<ul style="list-style-type: none">- Bonu s zone- Stairs up	<ul style="list-style-type: none">- Bonu s zone	<ul style="list-style-type: none">- Roofv alley- Risk/Rewa rd- 2-pat h	<ul style="list-style-type: none">- Bonu s zone	<ul style="list-style-type: none">- 2-hor d- Enem y valley	<ul style="list-style-type: none">- Multi ple gaps	<ul style="list-style-type: none">- 3-pat h- movi ng platfo rms- risk/r ewar d	<ul style="list-style-type: none">- Enem y valley- Pipe valley	<ul style="list-style-type: none">- Stairs up- movi ng platfo rms- multi ple gaps-	<ul style="list-style-type: none">- risk/r ewar d- 2-hor d- roof- Stairs up	<ul style="list-style-type: none">- enem y valley gap	<ul style="list-style-type: none">- Stairs up- Flagpole	<ul style="list-style-type: none">- Bonu s zone



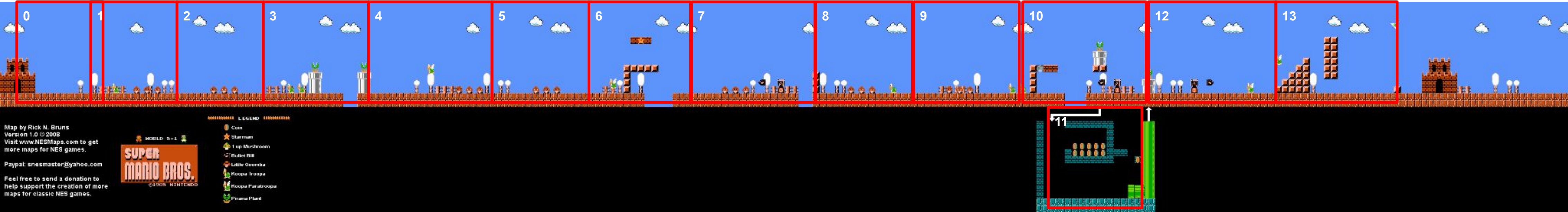
w4l3

0	1	2	3	4	5	6	7	8	9	10
<ul style="list-style-type: none">- beginning	<ul style="list-style-type: none">- Variable gaps- 2-hord	<ul style="list-style-type: none">- Gap enemy- 2-path- variable gap	<ul style="list-style-type: none">- 2-path- reward- moving platform- Variable gaps	<ul style="list-style-type: none">- Moving platforms- Variable gaps- 2-path	<ul style="list-style-type: none">- enemy- 3-path- Variable gaps	<ul style="list-style-type: none">- Variable gaps- moving platforms	<ul style="list-style-type: none">- Variable gaps- moving platforms	<ul style="list-style-type: none">- Variable gaps- moving platforms	<ul style="list-style-type: none">- Variable gaps- 2 path	<ul style="list-style-type: none">- Variable gaps- moving platforms- flagpole



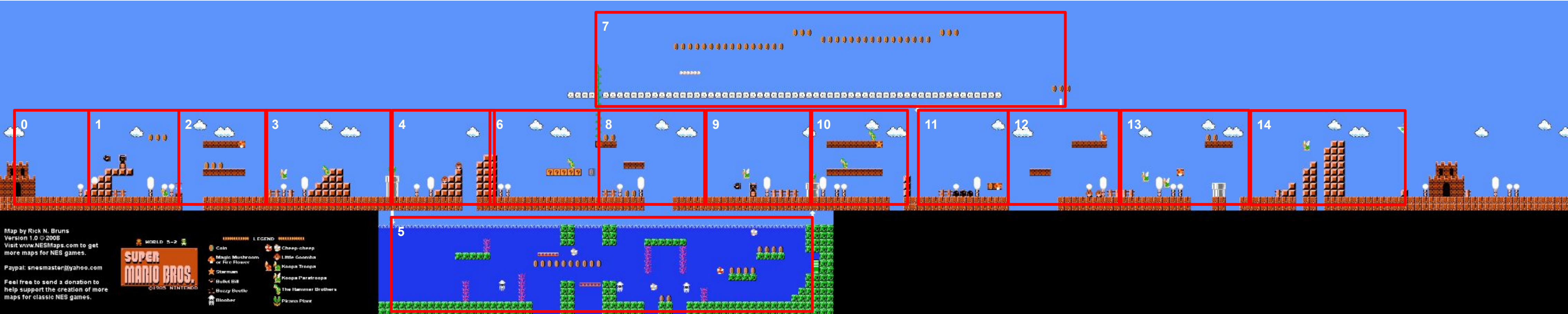
w5l1

0	1	2	3	4	5	6	7	8	9	10	11	12	13
- beginnin g	- enemy - 3-hord	- 3-hord	- 2-hord - gap - pipe valley	- enemy - 3-hord	- 3-hord	- enemy - gap - reward 2-path	- 3-hord - gap - enemy	- 3-hord - enemy	- 3-hord	- 2-hord - gap - reward enemy	- bonus zone	- enemy - 2 hord	- stairs up - flagpole



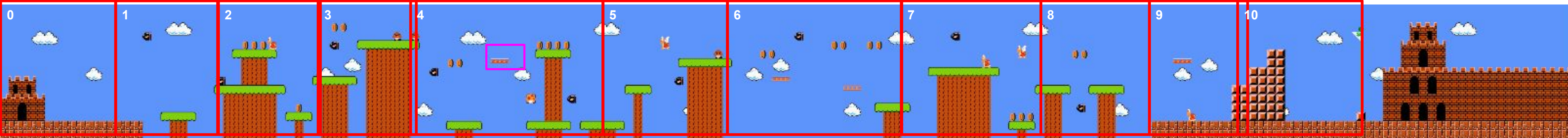
w5l2

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
- beginnin g	- stairs up - enemy -	- gap - 3-path - reward	- enemy - stairs up	- 2-hord - stairs up - gap	- bonus zone (aquawo rld)	- 2-path - enemy	- bonus zone (sky) - moving platform	- 2-path - gap	- enemy	- 3-path - enemy - risk/rew ard - gap - roof valley	- 3-hord - risk/rew ard	- gap - 2-path - enemy - 2-hord	- 2-hord - 2-path - risk/rew ard - Variable gaps	- Gap enemy - multiple gaps - stairs-up - flagpole



w5l3

0	1	2	3	4	5	6	7	8	9	10
<ul style="list-style-type: none">- beginning	<ul style="list-style-type: none">- Variable gaps- enemy	<ul style="list-style-type: none">- Multiple gaps- enemy	<ul style="list-style-type: none">- gaps- 2 hord- enemy- 2-path	<ul style="list-style-type: none">- Variable gaps- enemy- moving platform- 2 path- reward	<ul style="list-style-type: none">- Variable gaps- Gap enemy	<ul style="list-style-type: none">- Variable gaps- enemy- moving platform	<ul style="list-style-type: none">- Variable gaps- Gap enemy	<ul style="list-style-type: none">- Variable gaps- enemy- 	<ul style="list-style-type: none">- moving platform- enemy	<ul style="list-style-type: none">- stairs-up- flagpole



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WORLD 5-3



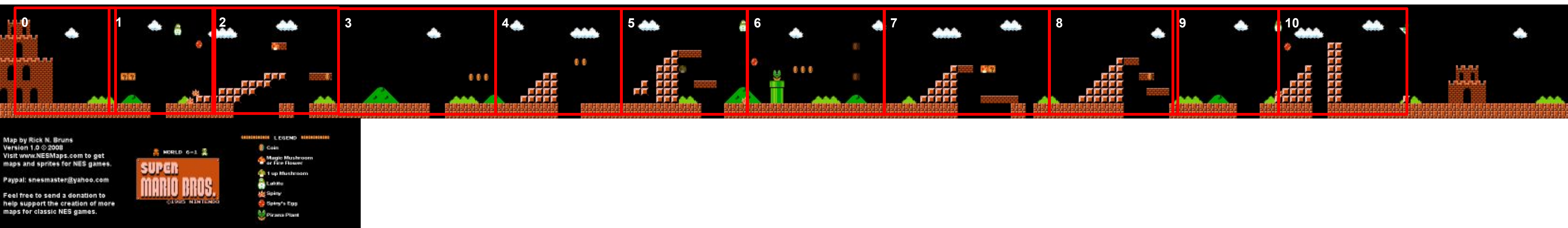
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LEGEND

- Coin
- Magic Mushroom or Fire Flower
- Little Goomba
- Koopa Troopa
- Koopa Paratroopa
- Bullet Bill

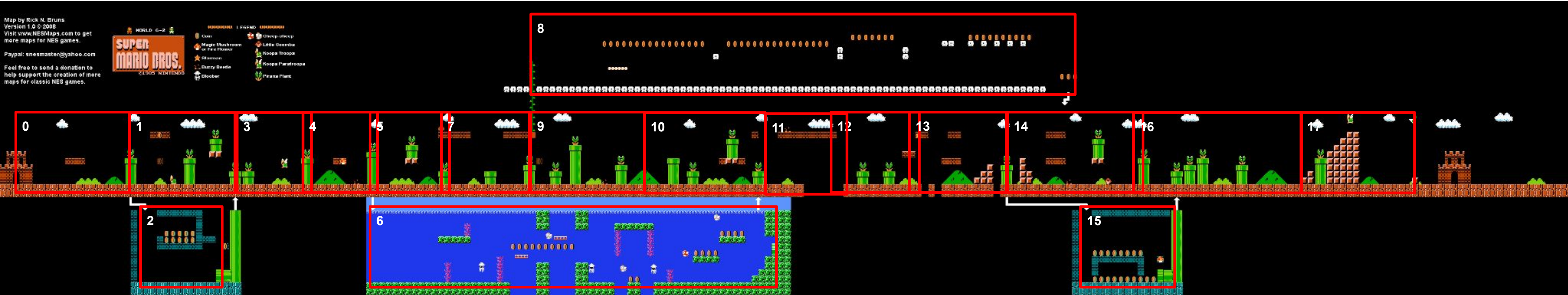
w6l1

0	1	2	3	4	5	6	7	8	9	10
- beginning	<ul style="list-style-type: none"> - gap - enemy - 2-hord - 	<ul style="list-style-type: none"> - stairs up - 2-path - risk/reward - enemy - Variable gaps 	<ul style="list-style-type: none"> - gap - enemy 	<ul style="list-style-type: none"> - stairs up - gap - enemy 	<ul style="list-style-type: none"> - stairs up - enemy - risk/reward - gap 	- enemy	<ul style="list-style-type: none"> - stairs up - reward - enemy - roof - Variable gaps 	<ul style="list-style-type: none"> - stairs up - gap - enemy 	<ul style="list-style-type: none"> - gap - enemy 	<ul style="list-style-type: none"> - stairs up - gap - flagpole - enemy



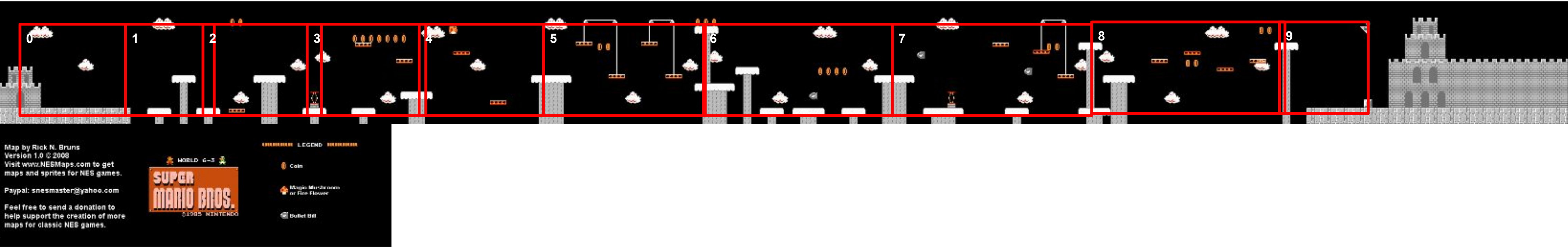
w6l2

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<div><div>- beginnig</div><div>- 2-path</div></div>	<div><div>- Roof valley</div><div>- 2-path</div></div>	<div><div>- bonu s zone</div></div>	<div><div>- Roof valley</div></div>	<div><div>- risk/reward</div><div>- roof valley</div></div>	<div><div>- roof valley</div></div>	<div><div>- bonu s zone (waterworld)</div></div>	<div><div>- roof valley</div><div>- 2-path</div></div>	<div><div>- bonu s zone (clouds)</div><div>- moving platform</div></div>	<div><div>- pipe valley</div><div>- enemy</div></div>	<div><div>- roof valley</div><div>- 2-path</div></div>	<div><div>- 2-path</div><div>- gap enemy</div></div>	<div><div>- pipe walle y</div><div>- 2-path</div></div>	<div><div>- multi ple gaps</div><div>- risk/reward</div><div>- stairs up 3</div><div>- 3 path</div></div>	<div><div>- 3-path</div><div>- roof valley</div></div>	<div><div>- bonu s zone reward</div></div>	<div><div>- pipe valley</div><div>- stairs up 3</div><div>- hord</div></div>	<div><div>- staur s up</div><div>- flagpole</div><div>- enemy</div></div>



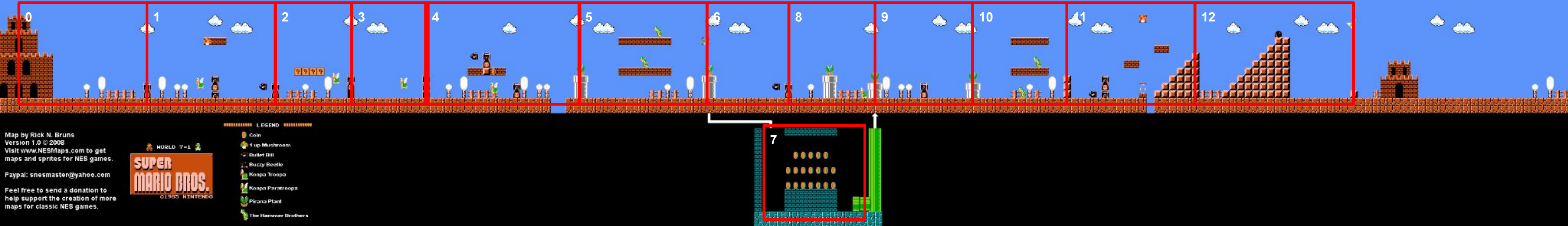
w6l3

0	1	2	3	4	5	6	7	8	9
- beginning	- Variable gaps	- Variable gaps - moving platform	- Variable gaps - moving platform - 2-path	- risk/reward - Variable gaps - moving platform	- Variable gaps - moving platform	- Variable gaps - enemy	- Variable gaps - moving platform - enemy	- Variable gaps - moving platform	- gap - flagpole



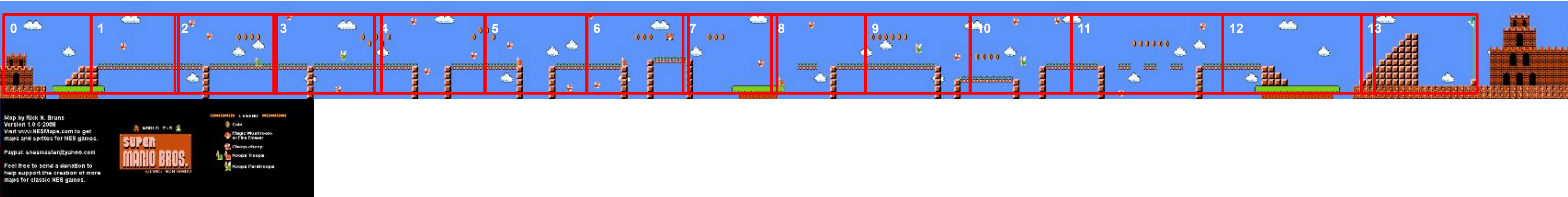
w7l1

0	1	2	3	4	5	6	7	8	9	10	11	12
<ul style="list-style-type: none">- beginning- enemy	<ul style="list-style-type: none">- enemy valley- risk/reward	<ul style="list-style-type: none">- Roof valley- 2-path	<ul style="list-style-type: none">- enemy valley	<ul style="list-style-type: none">- enemy valley- roof- gap- 2-path	<ul style="list-style-type: none">- 3-path- enemy- Roof valley	<ul style="list-style-type: none">- enemy valley- risk/reward	<ul style="list-style-type: none">- bonus zone	<ul style="list-style-type: none">- empty valley- enemy valley	<ul style="list-style-type: none">- empty valley- enemy valley	<ul style="list-style-type: none">- 3-path- roof valley	<ul style="list-style-type: none">- 3-path- enemy valley- gap- stairs up	<ul style="list-style-type: none">- stairs up- enemy- flagpole



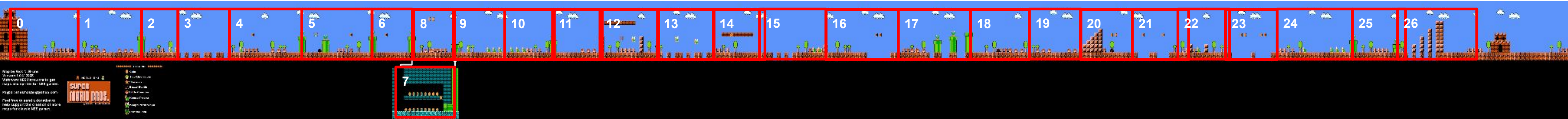
w7l3

0	1	2	3	4	5	6	7	8	9	10	11	12	13
<ul style="list-style-type: none">- beginning- gap- stairs up	<ul style="list-style-type: none">- enemy	<ul style="list-style-type: none">- enemy	<ul style="list-style-type: none">- enemy	<ul style="list-style-type: none">- Gap enemy	<ul style="list-style-type: none">- Gap enemy	<ul style="list-style-type: none">- Gap enemy- risk/reward	<ul style="list-style-type: none">- Gap enemy	<ul style="list-style-type: none">- Gap enemy- Variable gaps	<ul style="list-style-type: none">- Gap enemy	<ul style="list-style-type: none">- Gap enemy	<ul style="list-style-type: none">- Variable gaps- Gap enemy	<ul style="list-style-type: none">- Gap enemy- stairs down	<ul style="list-style-type: none">- stairs up- flagpole



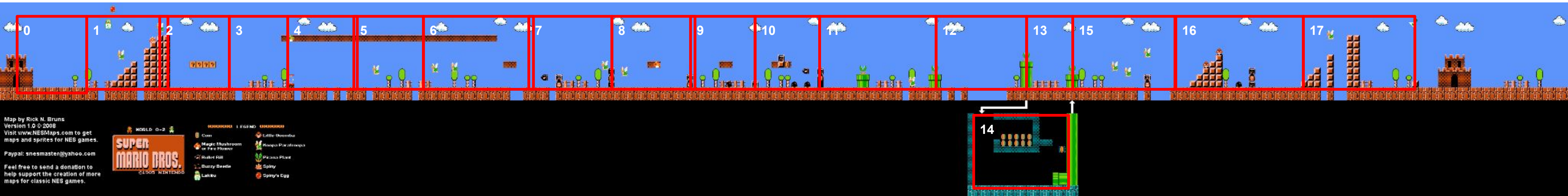
w8l1

	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
enemy 3-hord	<ul style="list-style-type: none">- enemy valley- risk/reward- pipe valley	<ul style="list-style-type: none">- pipe valley	<ul style="list-style-type: none">- bonus zone	<ul style="list-style-type: none">- 3-hord- enemy valley	<ul style="list-style-type: none">- enemy 3-hord	<ul style="list-style-type: none">- 3-hord	<ul style="list-style-type: none">- 3-hord- enemy valley	<ul style="list-style-type: none">- Roof valley- 2-path	<ul style="list-style-type: none">- 2-hord- Variable gaps- Gap enemy	<ul style="list-style-type: none">- reward- 2-path	<ul style="list-style-type: none">- Variable gaps- 2-hord	<ul style="list-style-type: none">- gap	<ul style="list-style-type: none">- 3-hord- Pillar gaps	<ul style="list-style-type: none">- enemy 3-hord	<ul style="list-style-type: none">--



w8l2

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
- begin - ning - enem - y	- Gap - enem - y - stairs - up - multi - ple - gaps	- 2-pat - h - enem - y	- gap - enem - y	- multi - ple - gaps - rewar - d	- Gap - enem - y - multi - ple - gaps	- 2-hor - d - gap - enem - y	- Gap - enem - y - enem - y - valley	- enem - y - valley - risk/r - ewar - d - roof - 2 - path	- enem - y - valley - roof - 2-pat - h	- 2-hor - d - enem - y - valley - roof - 2-pat - h	- empt - y - valley - gap - enem - y - enem - y - valley - pipe - valley	- Varia - ble - gaps	- pipe - valley	- bonu - s - zone	- 3-hor - d - Varia - ble - gaps - Gap - enem - y	- 2-hor - d - enem - y - valley - stairs - up	- gap - enem - y - stairs - up - Varia - ble - gap - flagp - ole



w8l3

0	1	2	3	4	5	6	7	8	9	10	11
<ul style="list-style-type: none">- beginning enemy- enemy	<ul style="list-style-type: none">- enemy valley	<ul style="list-style-type: none">- empty valley	<ul style="list-style-type: none">- 3-path enemy- gap- risk/reward	<ul style="list-style-type: none">- stairs down- gap- enemy	<ul style="list-style-type: none">- enemy valley- empty valley	<ul style="list-style-type: none">- 3-path risk/reward- enemy- Pillar gap- Roof valley	<ul style="list-style-type: none">- Enemy	<ul style="list-style-type: none">- enemy	<ul style="list-style-type: none">- enemy	<ul style="list-style-type: none">- enemy valley	<ul style="list-style-type: none">- stairs up- multiple gaps- flagpole

