Music visualisation with WebGL

Imatge Sintètica 2015

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Why?

- Alternative: Massively parallel raytracer in CUDA
  - Already exists! Zero impact.
- However bad my visualisation, more impact

How?

- Web audio API:
  - Get current playing buffer (waveform)
  - Get Fast Fourier Transform
- Particles?

First attempt: Elm

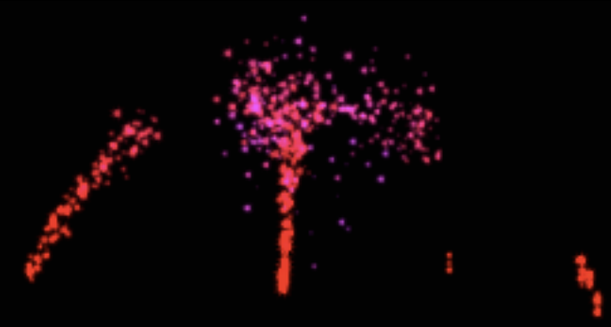
- Functional reactive language
  - Excellent for GUI
  - State hidden in “signals”, no side effects other than signals.
  - Input -> State -> State, State -> View

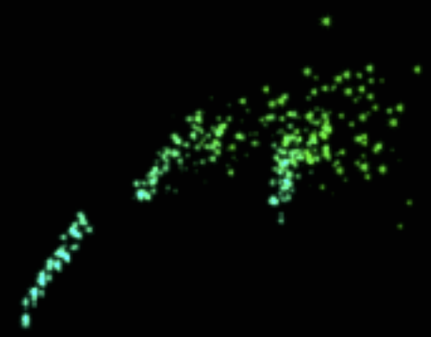
Bad performance

- Current implementation compiles to Javascript, creates new State at every frame
- Uses up infinite memory
- 10 FPS at 100% CPU
- Not suitable for graphics

Second attempt: Javascript

- THREE.js
- MIDI.js
- Gave up on using FFT
- 60 FPS



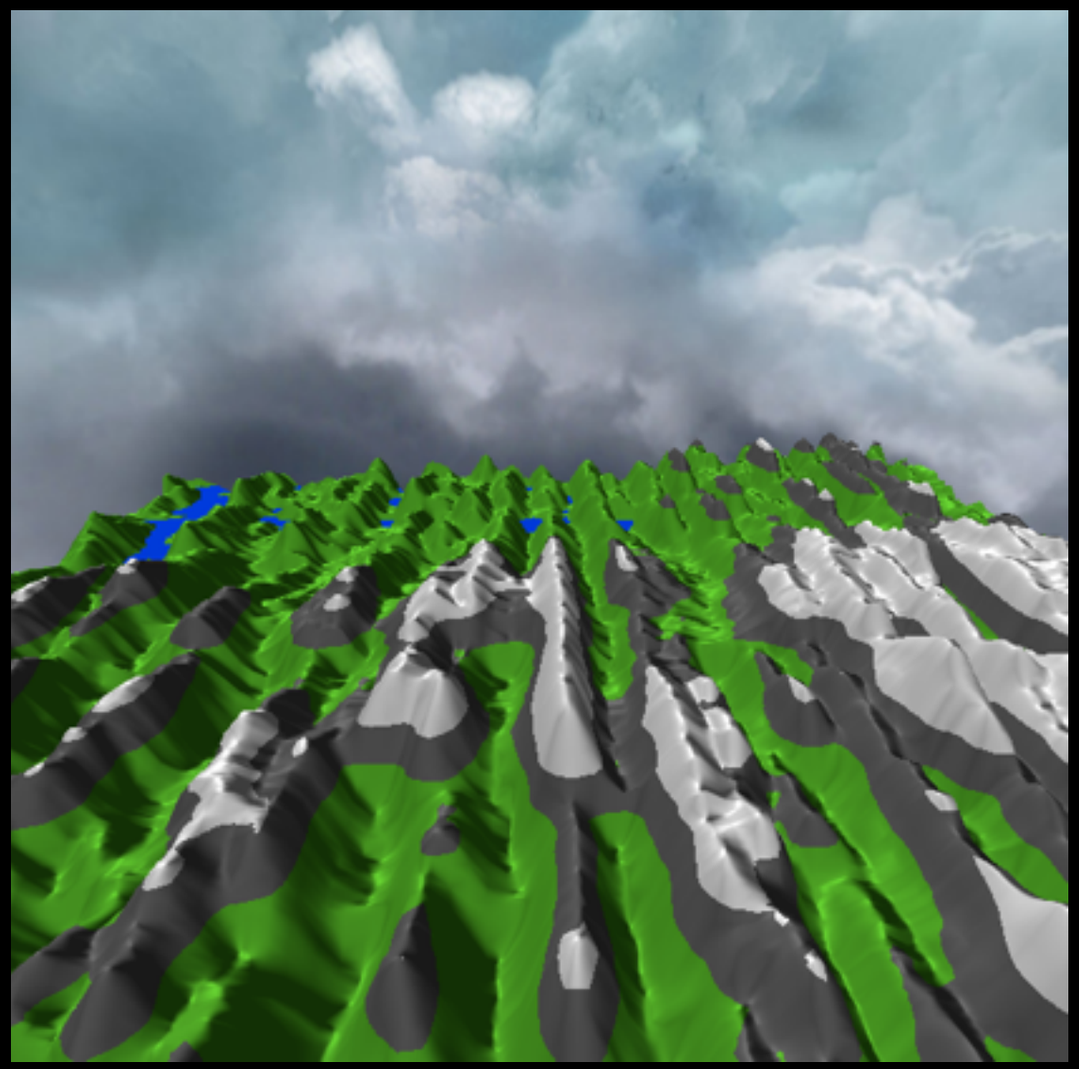


Third attempt: Height map

- Grid plane
- Radial FFT mapped:
  - to displacement
  - to color
- Detect kicks and throw up some particles
- Waveform moves FFT

Variation: Terrain generation

- Map frequencies to the generation of new terrain
- Basic height to color mapping
- Calculate normals from vertex positions



Finally: coloured height map

- Calculate normals for illumination
- Light goes on with a random color on a kick

Demo time!

http://rhaps0dy.bananabo.xyz/

Thanks!