

# Ruby code from the stratosphere

- SIAF, Sonic Pi, Petal



Kenichi Kanai @kn1kn1

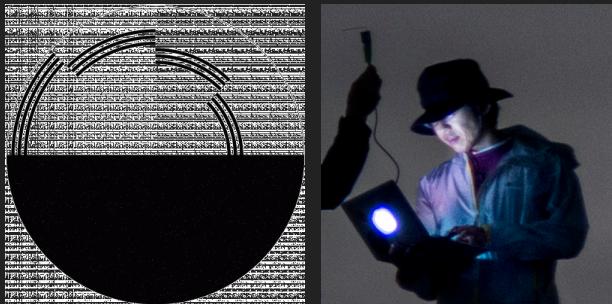
RubyKaigi 2018

2018.06.02 10:50-11:30 Hagi #rubykaigiC

# Ruby code from the stratosphere

```
2017/10/19 21:37:11 `cfdr la:43.213702,lo:141.993971,a:11990.8`  
2017/10/19 21:40:19 `d1'v*4 v*2',n:'irand',rate:'irand 1 2'`  
2017/10/19 21:41:24 `cps 0.3`
```

# Kenichi Kanai @kn1kn1



- a software engineer at Sapporo
- a member of SIAF LAB.
- a contributor/translator of Sonic Pi
- a software engineer at Farmnote

## [PR] Farmnote



- <https://farmnote.jp/>
- 「世界の農業の頭脳を創る。」

# Agenda

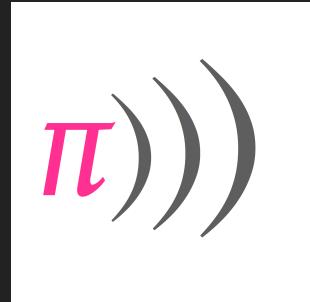
- Petal
  - Sonic Pi
  - Livecoding
  - TidalCycles
  - Petal Patterns
- SIAF2017
  - space-moere
  - ARTSAT x SIAFLAB
  - Launches
- Session Notes
  - <https://gist.github.com/kn1kn1/c28f8029ba5ee069d83b8b6a6c4c8543>
  - <http://rubykaigi.org/2018/presentations/kn1kn1.html#jun02>

# Petal



- <https://github.com/siaflab/petal>
- a small language on [Sonic Pi](#) with similar syntax to [TidalCycles](#).
- developed by me

# Sonic Pi



- <http://sonic-pi.net/>
- "The Live Coding Music Synth for Everyone"
- developed by Sam Aaron
- Ruby

- <http://rubykaigi.org/2016/presentations/juliancheal.html>
  - Julian Cheal at RubyKaigi 2016
- Mario theme
  - written by Xavier Riley(@xavriley), Sonic Pi main committer
  - Making Chiptune Music using Sonic Pi v2.0
  - <https://gist.github.com/xavriley/87ef7548039d1ee301bb>

- Repl Electric - You fall into your screen
  - <https://vimeo.com/265785040#t=40s>
  - performed by Joseph Wilk(@josephwilk), Sonic Pi main committer
- Live coding at CCSS2015 Closing Party
  - <https://vimeo.com/137140871#t=40s>
  - performed by me
  - <https://github.com/kn1kn1/ccss2015>

# Livecoding

- live coders expose and rewire the innards of software while it generates improvised music and/or visuals.
  - 「コンピュータの言語であるプログラムコードを直接操作することで、さまざまな音や映像をリアルタイムに生成する即興演奏の方法」
- TopLap <https://toplaph.org/>
  - livecoding manifest
  - <https://toplaph.org/wiki/ManifestoDraft>

- Languages
  - Chuck
  - Extempore
  - Fluxus
  - Gibber
  - Max
  - Pure Data
  - SuperCollider
  - Overtone
    - using SuperCollider from Clojure
  - Sonic Pi
    - using SuperCollider from Ruby
  - TidalCycles
    - using SuperCollider from Haskell
- <https://github.com/toplap/awesome-livecoding/>

- Algorave <https://algorave.com/>
  - rave events by livecoder
  - guideline: <https://github.com/Algorave/guidelines/blob/master/README.md>
- 6/3 (tomorrow) Algorave Tokyo
  - <http://algorave.tokyo/>

# TidalCycles



- <https://tidalcycles.org/>
- developed by Alex McLean
- Haskell
-

- 

- 'Alex McLeanの16年にわたるアルゴリズミックなダンスマジックの制作経験を基にしたライブコーディング環境'
- <https://courses.ideate.cmu.edu/15-104/f2016/2016/09/23/rgriswol-lookingoutwards-04/>
- simple notation generates complex sounds
  - 簡単な記法で複雑な音楽を記述可能

- moxus + TokisatoMiztsuru - Algosix Live Stream Performance - March 17, 2018 08:30 UTC
  - <https://www.youtube.com/watch?v=uK3tS8VNUvY&t=60>
  - performed by @moxus

- Alex McLean will visit Japan between 8th and 18th November
  - <https://slab.org/live-coding-tokyo-yorkshire/>

# Petal



- <https://github.com/siaflab/petal>
- a small language on [Sonic Pi](#) with similar syntax to [TidalCycles](#).

# Petal (Tidal) patterns

- one bass drum per cycle

```
d1 'bd'
```

- two bass drums per cycle

```
d1 'bd bd'
```

- nested bass drums

```
d1 'bd [bd bd]'
```

- specifying tempo (cps: cycle per second)

```
cps 2  
d1 'bd [bd bd]'
```

- index option

```
d1 'v', n: 1
```

- rate option

```
d1 'v', rate: 4
```

- randomize

```
d1 'v', rate: 'irand 1 2'
```

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```

- Euclidean rhythm

```
d1 'bd(5,8)'
```

- 5: pulse、 8: step
- Godfried Toussaint(2005) "The Euclidean Algorithm Generates Traditional Musical Rhythms"
  - The Euclidean algorithm which computes the greatest common divisor of two given integers may be used to generate traditional musical rhythms.
    - 「2つの数の最大公約数を求めるユークリッドのアルゴリズムをリズムに適用することにより、伝統的なリズムを記述可能である。」
  - The first number of sounds (5) will be distributed equally across the second number of steps (8).
    - 上の例では、2つめの数(8)のステップを通じて、最初の数(5)のパルスを等間隔で分散させようします。
- <http://dbkaplun.github.io/euclidean-rhythm/>

```
require "~github/petal/petal.rb"

cps 0.5

d1 ":bd_klub(11,16)"
d2 ":bd_haus(6,16)"
d3 "hh(13,16)", rate: 'rand -1 1'
d4 "if(11,16)", n: 'irand 64', rate: 'rand -1 1'
```

- <https://vimeo.com/223727860>

# Inside Petal

- TidalCycles pattern is something like...
  - , , ,
  - , , ,
  - , , ,
- by @melborne
  - <https://melborne.github.io/2010/11/10/Ruby-Lisp/>

- create Cycle object by parsing code text
  - [https://github.com/siaflab/petal/blob/master/petal\\_data.rb](https://github.com/siaflab/petal/blob/master/petal_data.rb)
  - <https://github.com/siaflab/petal/blob/master/petal.rb#L173>
- play sounds with Cycle object
  - <https://github.com/siaflab/petal/blob/master/petal.rb#L197-L203>

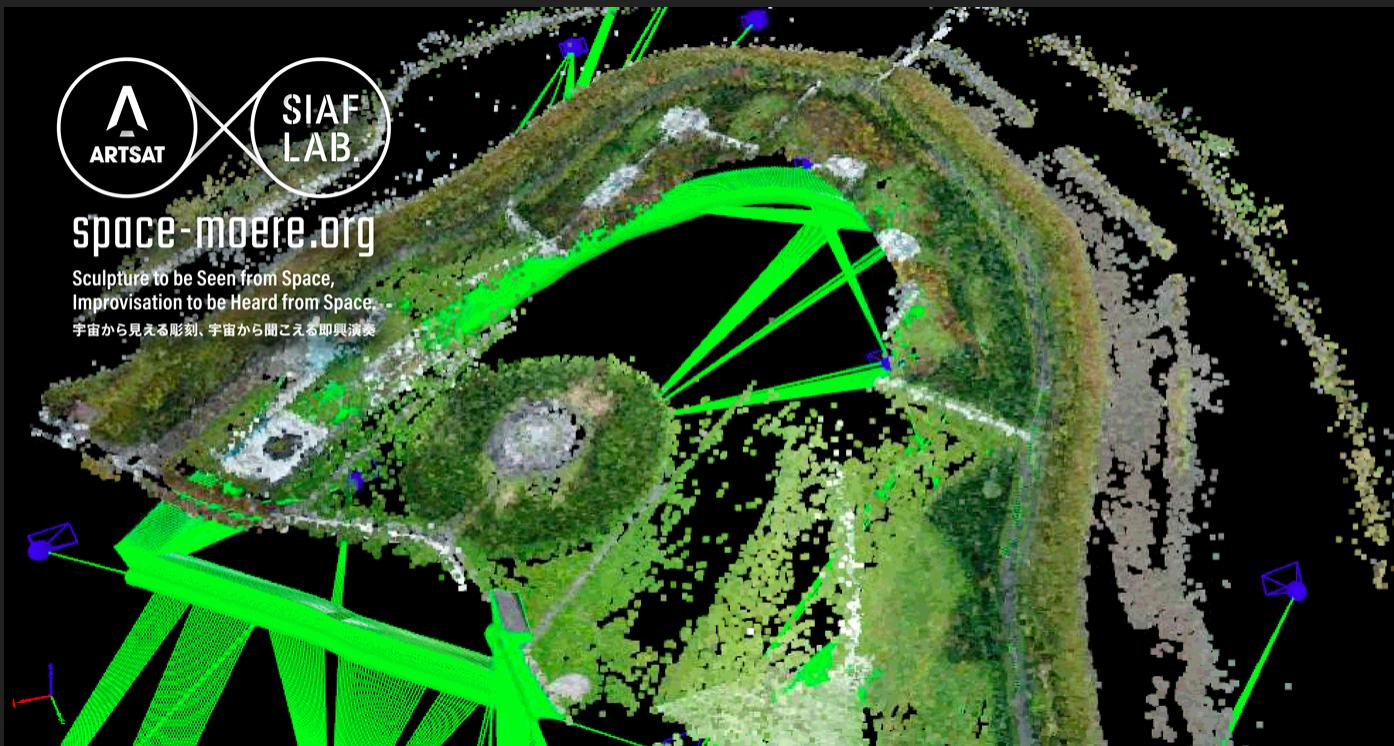
- Euclidean Rhythm library
  - <https://github.com/kn1kn1/EuclideanRhythm>

# SIAF2017



- <https://siaf.jp/2017/>

# ARTSAT x SIAF LAB.



- Sculpture to be Seen from Space, Improvisation to be Heard from Space.
- 宇宙から見える彫刻、宇宙から聞こえる即興演奏
  - <https://siaf.jp/2017/en/artists/artsat-siaflab.html>
  - <http://space-moere.org/>

# ARTSAT x SIAF LAB.



space-moere.org

- ARTSAT
- SIAF LAB

# ARTSAT



- 
- collaboration with Tama Art University and the University of Tokyo
- promoting the cultural and artistic use of the universe with the motto “Satellites as media.”

- In February 2014, the world's first art satellite "ARTSAT 1: INVADER" was launched.
- In December 2014, "ARTSAT 2: DESPATCH," a deep space sculpture capable of leaving the gravitational sphere of the earth was launched into heliocentric orbit at the same time as the "Hayabusa 2."

# SIAF LAB.



- began activities from 2015, the year after SIAF2014.
- conducts civil collaborative projects
  - art-related lecture series
  - “Bent Icicle Project – Tulala”

# Sonic Pi and SIAF LAB.

- organize Sonic Pi workshop for 3 times from 2015
- translate Sonic Pi application and tutorials into Japanese
  - <https://github.com/samaaron/sonic-pi#translations>
- create extension package for Sonic Pi
  - Haskap Jam Pack
  - <https://github.com/siaflab/haskap-jam-pack/>

# Moerenuma park

- designed by Isamu Noguchi
- it “constitutes one sculptural work as a whole.”



- <http://moerenumapark.jp/english/>

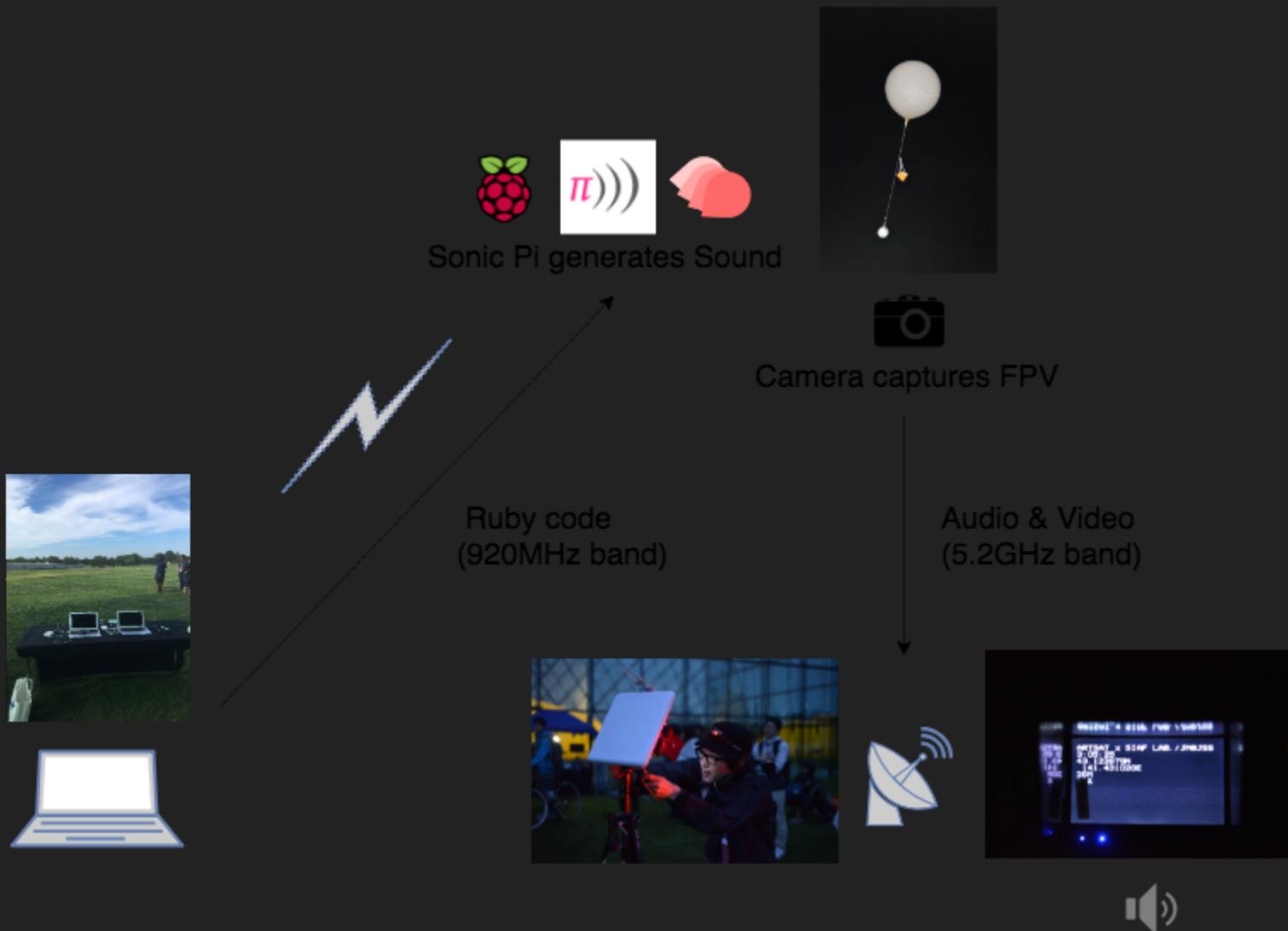
# Launches

- 2017-07-01 - 1st trial launch for exhibition
- 2017-07-17 - 2nd trial launch for exhibition
- 2017-08-23 - 1st launch with performance (FAIL)
- 2017-10-07 - 3rd trial launch (with revised system)
- 2017-10-19 - 2nd launch with performance

## 2017-07-01 - 1st trial launch for exhibition

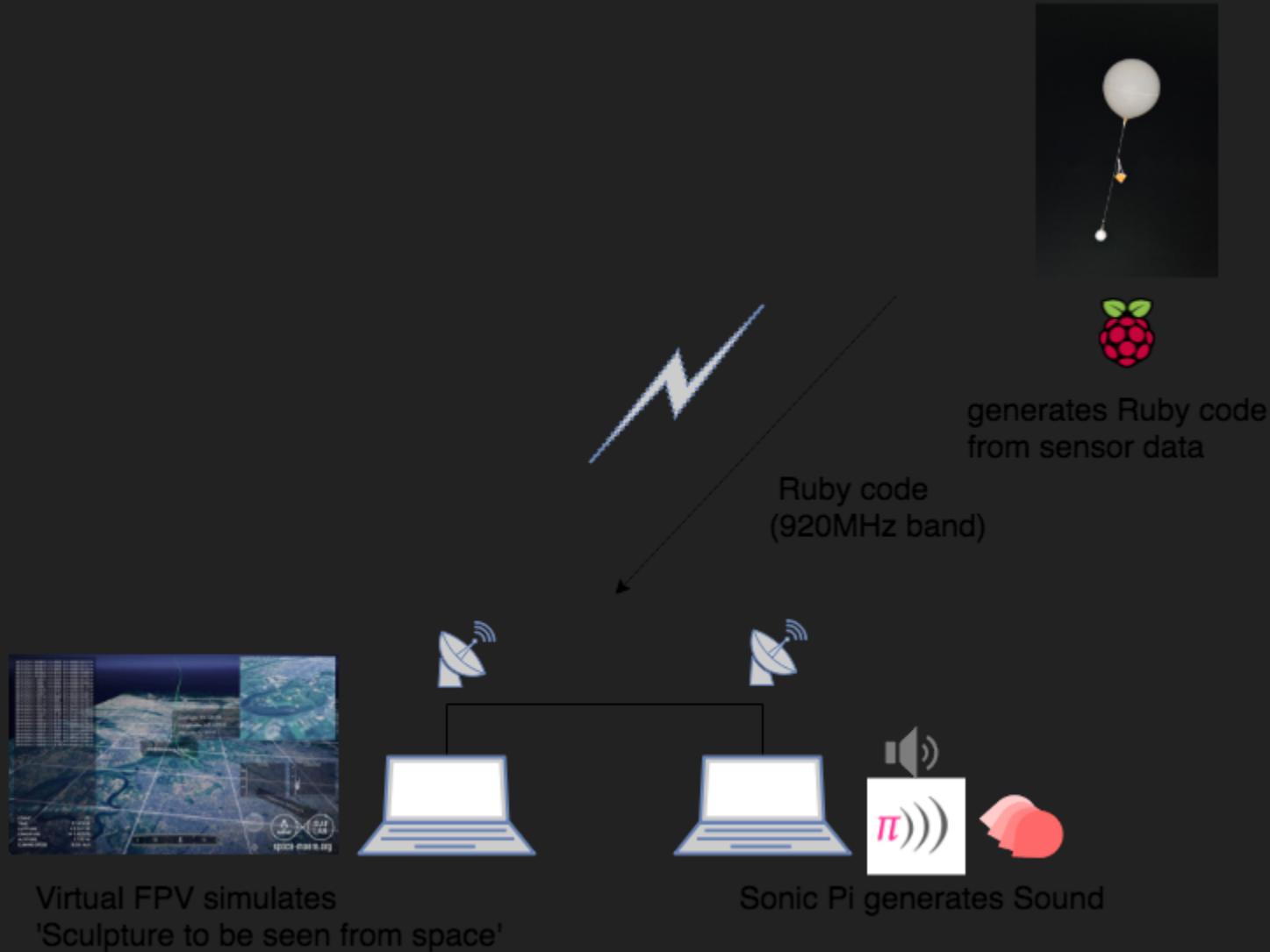
- <http://daily.siaf.jp/1629/>

# System (gorgeous, but it FAILED)



- Live-coding performance 22.Aug.2017
  - <https://www.youtube.com/watch?v=5pka7xB2eh8>
  - <https://youtu.be/5pka7xB2eh8?t=4160>

# Revised system



# VirtualFPV



- created by @aike1000 (Keisuke Ai) SmileBoom
  - [https://github.com/siaflab/VirtualFPV\\_balloon\\_trajectory\\_visualizer](https://github.com/siaflab/VirtualFPV_balloon_trajectory_visualizer)

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```

# space-moere-flight-data

- <https://github.com/siaflab/space-moere-flight-data>
- 20171019
  - <https://github.com/siaflab/space-moere-flight-data/blob/master/171019/171019o1.log>
  - <https://github.com/siaflab/space-moere-flight-data/blob/master/171019/171019o2.log>
- ARTSAT × SIAF LAB. Livecoding Performance at Gwangju Media Art Festival 2017 (short ver)
  - <https://www.youtube.com/watch?v=248V83NYL-w>

- Midsummer Festival (夏至祭 Geshisai) at Moerenuma park
  - <https://space-moere.org/midsummer/>



