

The Big Bang Universe for World Wide Web

Vishesh Yadav

Northeastern University

Hey, I just read the greatest book, Realm of Racket, and I programmed my own video game

Cool, I want to play it!

Sure. First download and install Racket.

www.racket-lang.org

Give me your email, I will send you a file. Run it with Racket

Umm, ok will do it later this evening



iMessage

Send

Hey, I just read the greatest book, Realm of Racket, and I programmed my own video game

Cool, I want to play it!

Sure. First download and install Racket.

www.racket-lang.org

Give me your email, I will send you a file. Run it with Racket

Umm, ok will do it later this evening



iMessage

Send

Hey, I just read the greatest book, Realm of Racket, and programmed my own game

Cool, I want to play it!

Visit <http://bigbang.ccs.neu.edu/get/7VES>

Neat! I'm going to read the book too!



iMessage

Send

Whalebin

- Share big-bang games
- Inspired by MIT Scratch
- Find Whalesong bugs and improve it
- Has a DrRacket plugin

Demo

<http://bigbang.ccs.neu.edu>

Site Architecture

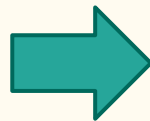
- Racket Web Server
- Whalesong
- MySQL
- Elasticsearch
- nginx as reverse proxy

Whalesong: Racket -> JavaScript compiler

- #lang whalesong is subset of Racket
- Some changes to code required
- Most HTDP programs can be ported by

```
#lang ...
```

```
(require 2htdp/universe)  
(require 2htdp/image)  
(require racket/list)
```



```
#lang whalesong
```

```
(require whalesong/world)  
(require whalesong/image)  
(require whalesong/lang/list)
```

- Thanks to Danny Yoo, Jens Axel Sogaard, Emmanuel Schanzer, Darren Cruse ...

Whalesong: Limitations

- Doesn't implement full Racket
- Keyword arguments don't work
- GRacket sources - can't use image literals
- Macros - Work in progress
- Can't install from package manager
- Performance

Web Development in Racket - My Experience

- The Good Parts
- The Bad Parts

Web Development in Racket: The Good Parts

- jsexprs, xexprs are cool
- Continuations can be useful ... not many times
- Parameters are cool
- Don't need framework

Web Development in Racket: The Bad Parts

- Lack of Libraries
 - eg. Form validation, ORM or SQL builder, Elasticsearch
 - Unmaintained libraries
- I missed ORM or SQL builder
 - Saves lot of grunt work

```
(++ "SELECT e.id, e.name, d.name "  
    " FROM employee as e, department as d "  
    " WHERE e.joining_year = ? AND "  
    "     e.age = ? AND "  
    "     e.deptid = d.id;")
```

vs

```
(select '([employee e]  
        [department d])  
#:fields `(e.id e.name d.name)  
#:where `(and  
          (> e.joining_year ,year)  
          (< e.age ,age)  
          (= e.deptid d.id)))
```

Wrote Elasticsearch library. Started working on the above DSL (taking ideas from Korma and SXQL)

Continuation based Web Server - Advantages

- Good for Wizard like UIs
- Convenient and no grunt work managing state
- Confident about correctness

But

- Not useful for single page web-apps
 - Most new applications are single page web-apps
 - They provide all necessary information in single request
- Can't scale straight out of box
 - Need distributed continuation managers

Thank you!

Play at

<http://bigbang.ccs.neu.edu>