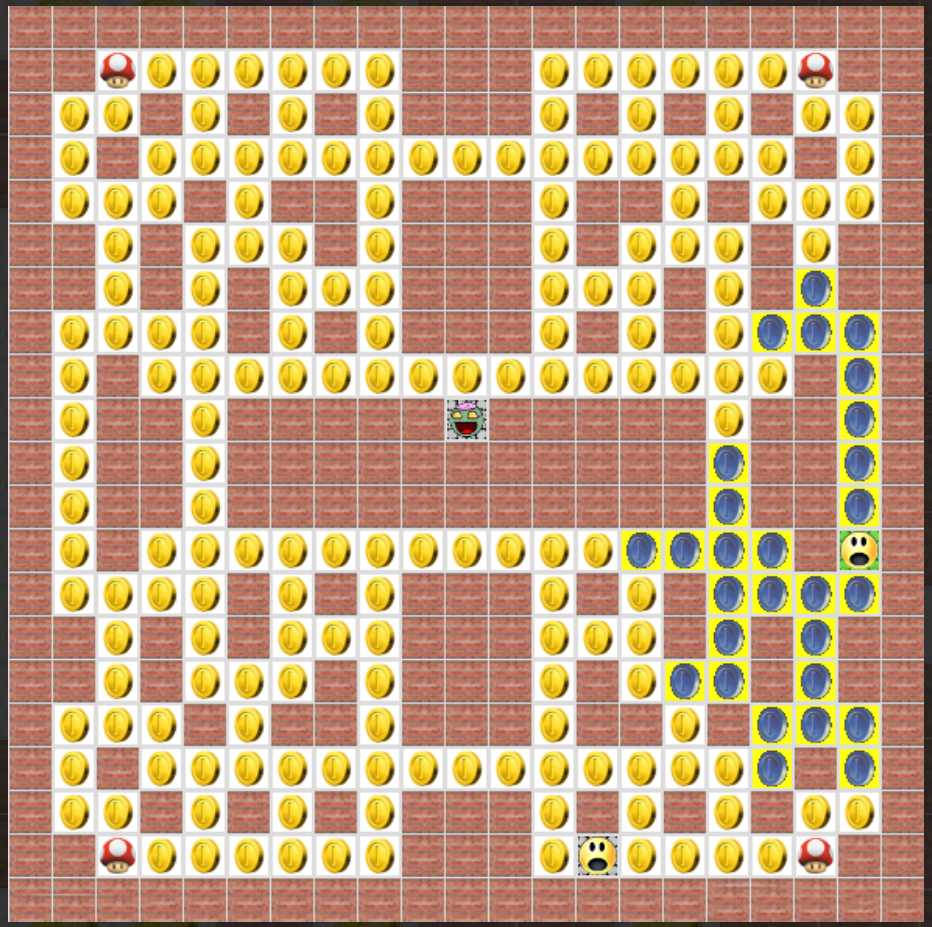
TacZombie

(a tactical Pacman clone)



Developed by Lars Eckervogt, Manuel Hieke and Stefan Junker for the course “Moderne Programmiersprachen” in MSI1 in WS13/14 at HTWG Konstanz

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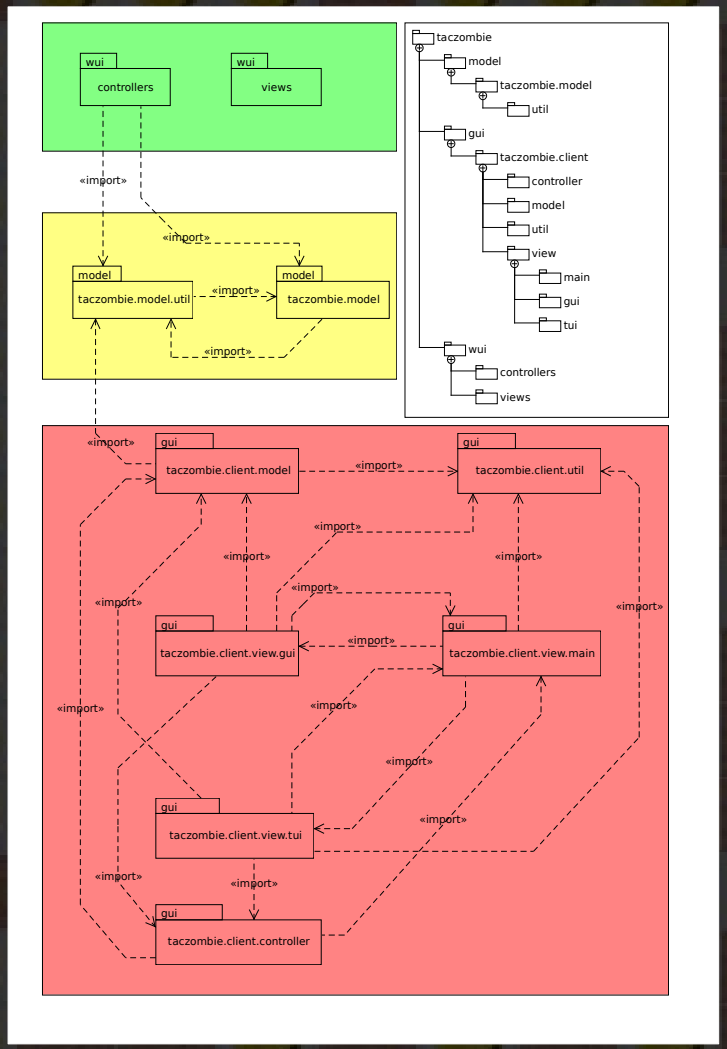
Game Principle

- Round-based
- Two Players
  - **One** Human: can have multiple tokens
  - **One** Zombie: can have multiple tokens
- Goal
  - Zombie: kill Human
  - Human: survive and collect all coins
- Map
  - Pacman-like

Structure


wui
controllers
wui
views
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«import»
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taczombie.model.util
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taczombie.client.view.tui
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gui
taczombie.client.controller

Model

- Case classes
  - Easy access of subsets
- Build to be extensible
  - Multiple Players (Zombie/Humans)

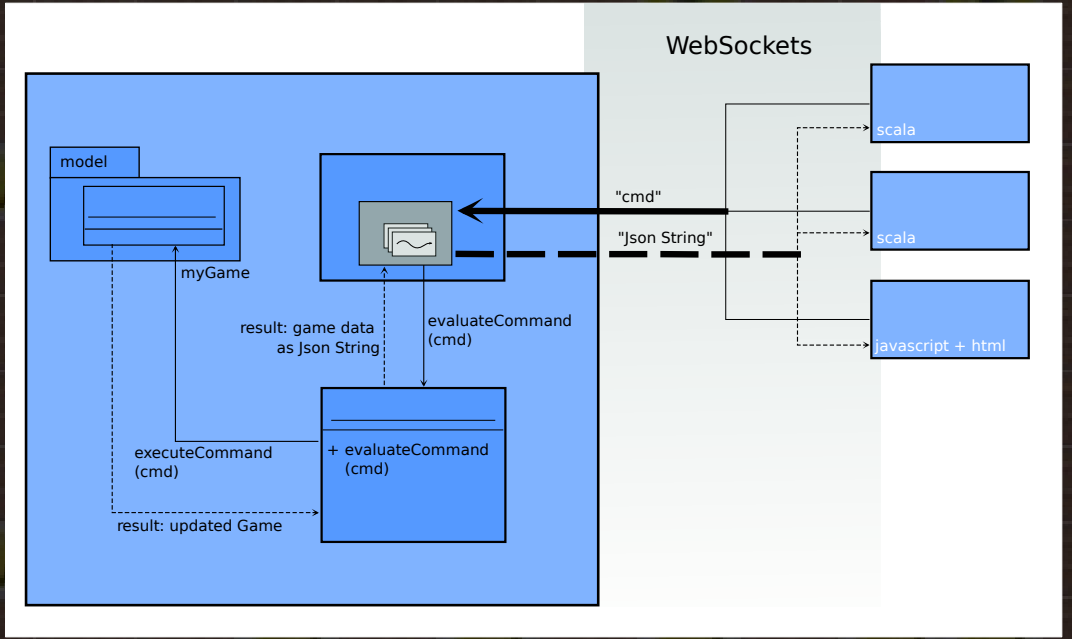
Views

- WUI
- TUI
- GUI

- Communication through web sockets
  - Library: just.ws (https://github.com/stasimus/just.ws)
- Transport format: jSON
  - Library: io.spray (https://github.com/spray/spray-json)

Controller

- Server-side: Play
  - Manages web socket connections
  - Manages the game
  - Handles incoming client requests
  - Servers game data to the clients
- Client-side:
  - GUI: Swing
  - WUI: JavaScript/Play



Use of Traits

- Example: Logger

```
5  trait Logger {
6    object logger {
7
8      private var printOnGet : Boolean = false
9
10     private val data : ListBuffer[String] = ListBuffer[String]()
11
12     def clear = data.clear()
13
14     def +=(s : String, print : Boolean = false) = {
15       data += s
16       if(print) println(s)
17     }
18
19     def init(s : String, print : Boolean = false, printOnGet : Boolean = false) =  {
20       clear
21       this.printOnGet = printOnGet
22       +=(s, print)
23     }
```

Use of Traits

- Example: Logger

```
24
25      def get : List[String] = {
26        if(printOnGet) print
27        data.toList
28      }
29
30      def merge(l : Logger) = {
31        data.++=(l.logger.get)
32        l
33      }
34
35      def print = {
36        if(data.size > 0) {
37          println(data.apply(0))
38          for(s <- data.tail)
39            println("\t" + s)
40        } else  println("Empty logger")
41      }
42    }
43  }
```

Use of Dependency Injection

- Main Method GUI / TUI

```
17 object Main {
18   def main(args: Array[String]) {
19     var restart = true
20     val viewInjector = Guice.createInjector(new UiModule(args))
21
22     while (restart) {
23       val view = viewInjector.getInstance(classOf[IView])
24       view.open
25       restart = view.runBlocking
26     }
27   }
28 }
29
```

Use of Implicit Conversions

- Example: CoordinateHelper

```
3  import scala.collection.mutable.ListBuffer
4  import scala.language.implicitConversions
5  import taczombie.model.Game
6  import taczombie.model.GameFieldCell
7  import taczombie.model.GameField
8
9  object CoordinateHelper {
10
11   implicit def intIntTuple2Wrapper(tuple: (Int,Int)) =
12       new IntIntTuple2Helper(tuple)
13
14   class IntIntTuple2Helper(tuple : (Int,Int)) {
15     def leftOf : (Int,Int) = (tuple._1, tuple._2 - 1)
16     def rightOf : (Int,Int) = (tuple._1, tuple._2 + 1)
17     def aboveOf : (Int,Int) = (tuple._1 - 1, tuple._2)
18     def belowOf : (Int,Int) = (tuple._1 + 1, tuple._2)
19   }
20 }
```

Use of Higher Order Function

- Example: JsonHelperSpec

```
16   val -- = (a:Int,b:Int) => a - b
17   val ++ = (a:Int,b:Int) => a + b
18
19   private def upperLeftFor5StepsInBothDimensions(coord : (Int,Int))
20     (y : Int, fn1 : (Int,Int) => Int)
21     (x : Int, fn2 : (Int,Int) => Int) = {
22     for {
23           i <- 0 until 5
24           j <- 0 until 5
25     } yield coord.isUpperLeftOf(fn1(y,i),fn2(x,j))
26   }.toList
 :
60       upperLeftFor5StepsInBothDimensions(testCoord1)(10, --)(11, ++)
61         .exists(_ == true) must be_!=(true)
```

Tests

- 200 fully automated Tests
- Code Coverage scct
  - Model 100%
  - GUI / TUI: Utils 100%
  - Controller 76%
- Coverage Report as html

Generate Standalone Game

- Server/WUI
  - sbt “project wui” dist
  - Generates zip file
  - Extract and execute Skript wui in bin/ to run server
- GUI/TUI
  - sbt assembly
  - Generates TacZombieClient.jar
  - Execute java -jar TacZombieClient.jar for GUI
  - Add parameter “tui” for TUI

Demo

- Lean back and enjoy :-)

Summary

- GUI & TUI & WUI usable
  - at the ***same*** time
  - on the ***same*** model
- Model fully automated tested
- Controller automated tested
- SBT Multi-project

- Scala is awesome!
- Swing is ok
- ScalaFx lacks of support and examples