



Automated testing of your Angular front-end

by Jago de Vreede and Robert Zwerus



devCON

is powered by



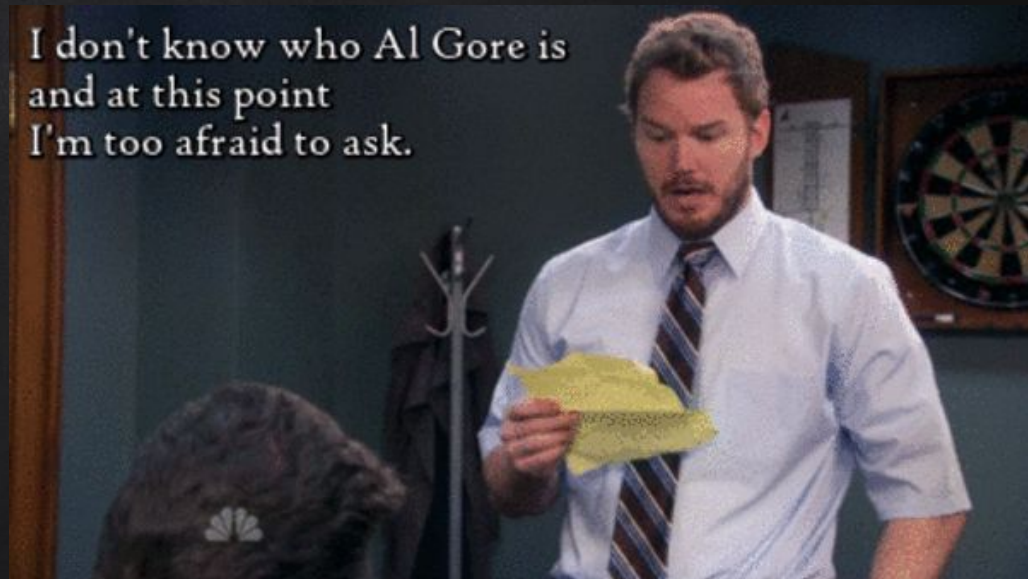


- Introduction
- About UI testing
- Why does it fail so often?
- What makes it a success?
- Architecture of demo app
- Live demo
- Running on CI server
- Conclusions



QUICK QUESTION? JUST ASK!

I don't know who Al Gore is
and at this point
I'm too afraid to ask.





ABOUT US



Robert Zwerus



Jago de Vreede

<http://www.luminis-technologies.com/>



UI TESTING (A.K.A. automated testing, end2end testing)

Test the entire system like a user would: by interacting with the front-end

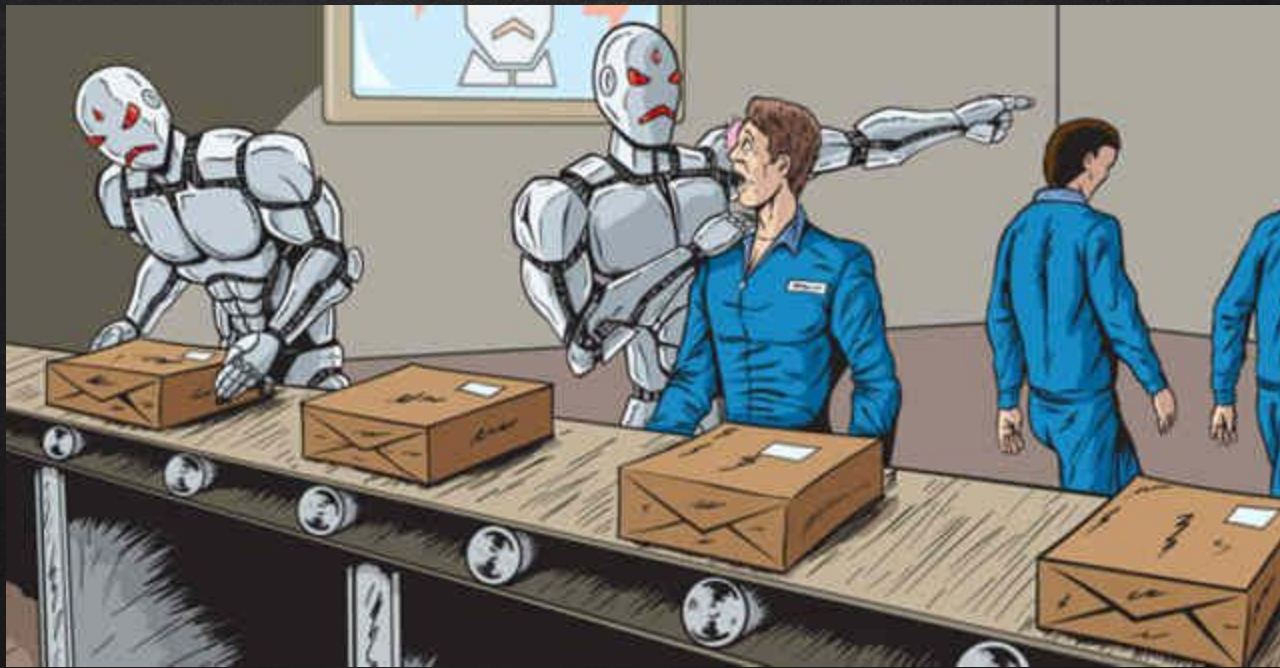
Can serve as a quick test to see if anything got broken between deployments



UI TESTING: WHY DOES IT FAIL SO OFTEN?



THE MACHINE CAN DO ONLY SO MUCH



THE MACHINE CAN DO ONLY SO MUCH

Just Todo It

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Welcome to Just Todo It!



THE MACHINE CAN DO ONLY SO MUCH

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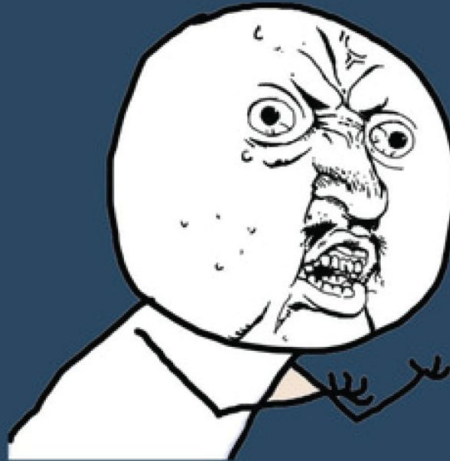
Welcome to Just Todo It!





UI TESTING: WHY DOES IT FAIL SO OFTEN?

WHY U GIVE ME



FALSE HOPE?



MORE REASONS FOR FAILURE

- Almost every change breaks a test -> coupling too tight
- Not ran often enough -> failures ignored
- Recording tests from browser hardly works

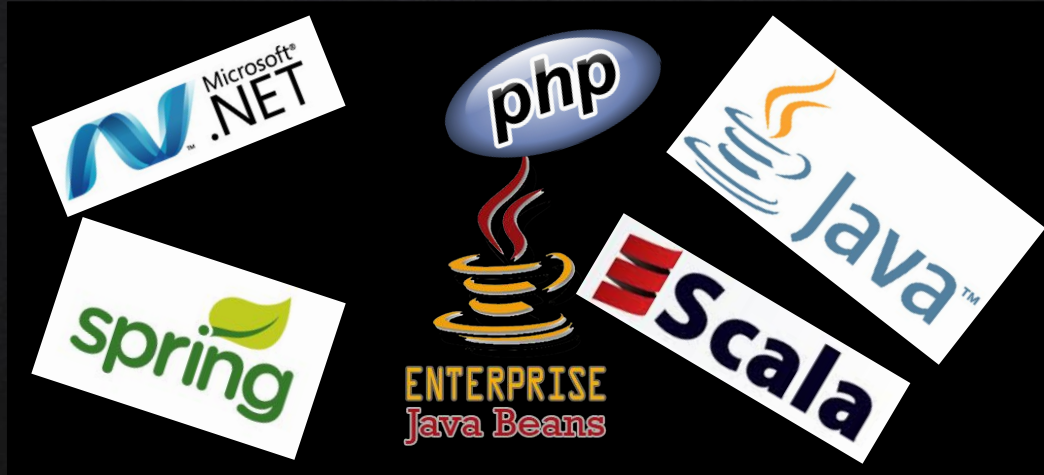


UI TESTING: WHAT MAKES IT A SUCCESS?

- Integrated in dev workflow
- Integrated on CI server, run after each commit/PR merge
- Suite runs quickly
- Easy to pinpoint cause of errors

HIGH LEVEL ARCHITECTURE

HTML, Angular, TypeScript



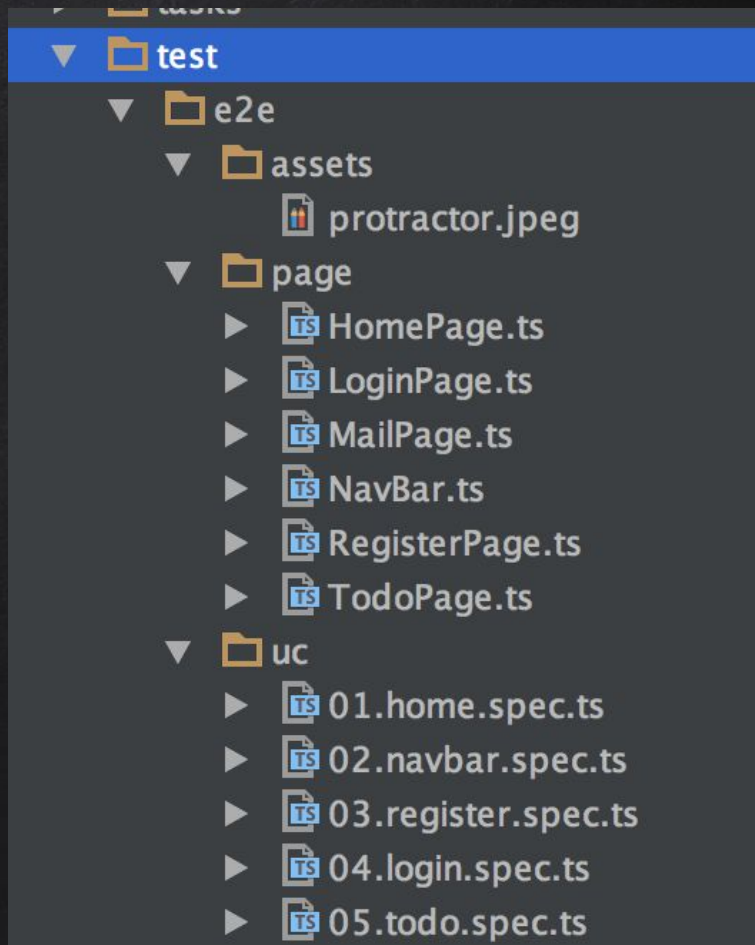


TYPESCRIPT

- ECMAScript 6
- Compiles to JavaScript
- Compile-time type checking
- Code completion



TEST STRUCTURE





PAGE OBJECTS

- Encapsulate information about a page
- Reusable
- Decouple the tests from implementations

WITHOUT PAGE OBJECTS

```
describe('Todo page', () => {
  let todoLists = element.all(by.repeater('todoList in todolistCtrl.todos'));

  it('should have one todo list with zero items', () => {
    expect(todoLists.get(0).all(by.xpath('..//ul/li')).count()).toEqual(0);
  });

  it('should be able to add a todo item', () => {
    let inputField = this.todoLists
      .get(0)
      .element(by.model('todoList.todo.name'));
    inputField.clear();
    inputField.sendKeys('test');

    todoLists.get(0).element(by.css('button.btn-primary')).click();
    expect(this.todoLists.get(0).all(by.xpath('..//ul/li')).count()).toEqual(1);
  });
});
```

WITH PAGE OBJECTS

```
import TodoPage = require('../page/TodoPage');

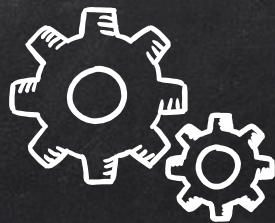
describe('Todo page', () => {
  let todo: TodoPage = new TodoPage();

  it('should have one todo list with zero items', () => {
    expect(todo.getTodos(0).count()).toEqual(0);
  });

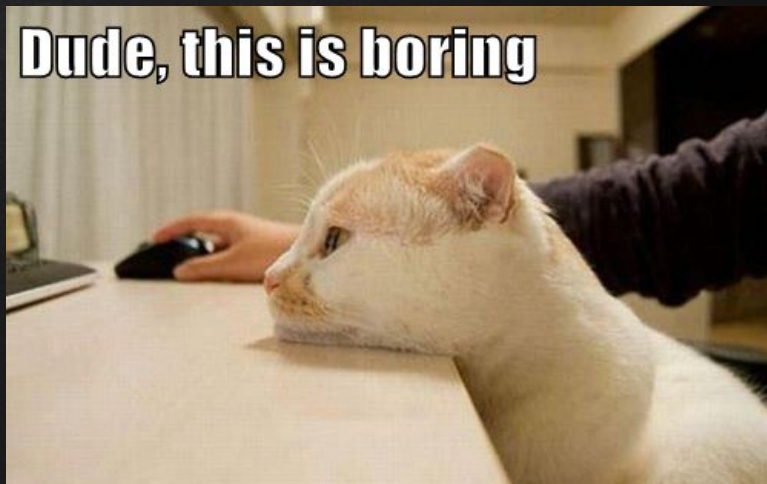
  it('should be able to add a todo item', () => {
    todo.addTodoItem(0, 'test todo');
    expect(todo.getTodos(0).count()).toEqual(1);
  });
});
```

WITH PAGE OBJECTS

```
class TodoPage {  
    addList = element(by.id('addNewList'));  
    todoLists = element.all(by.repeater('todoList in todoListCtrl.todos'));  
  
    getTodos(todoListIndex: number) {  
        return this.todoLists.get(todoListIndex).all(by.xpath('..//ul/li'));  
    }  
  
    addTodoItem(todoListIndex: number, todoItemDescription: string) {  
        let inputField = this.todoLists  
            .get(todoListIndex)  
            .element(by.model('todoList.todo.name'));  
        inputField.clear();  
        inputField.sendKeys(todoItemDescription);  
  
        this.todoLists.get(todoListIndex).element(by.css('button.btn-primary')).click();  
    }  
}  
  
export = TodoPage;
```



DEMO TIME!



Dude, this is boring

10 Minute Mail

Welcome to 10 Minute Mail

Beat spam with the best disposable e-mail service.

b3299382@trbvn.com is your temporary e-mail address.

[Click here](#) to copy this e-mail address to your clipboard

b3299382@trbvn.com

Your e-mail address will expire in 10 minutes.
I need more time! Give me [10 more minutes!](#)

You currently have 0 messages.

```
<form id="addyForm" name="addyForm" method="post" action="/10MinuteMail/index.html" enctype="application/x-www-form-urlencoded">
  <input type="hidden" name="addyForm" value="addyForm">
  <input id="addyForm:addressSelect" type="text" name="addyForm:addressSelect" value="b3299382@trbvn.com" size="30" style="font-s
  <input type="hidden" name="javax.faces.ViewState" id="javax.faces.ViewState" value="j_id38471">
</form>
```

Messages:≡

Read	From	Subject	Preview	Date
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Choose Your Language:

English [Change](#)

created by & copyright 2007-2015
[Devon Hillard @ DigitalSanctuary](#)
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Messages:☰

Read	From	Subject	Preview	Date
<input type="checkbox"/>	robert.zwerus@luminis.eu	Activate your Just Todo It account	Go to http://127.0.0.1:3000/#/register/activate	Apr 4, 2016 8:02:20 AM

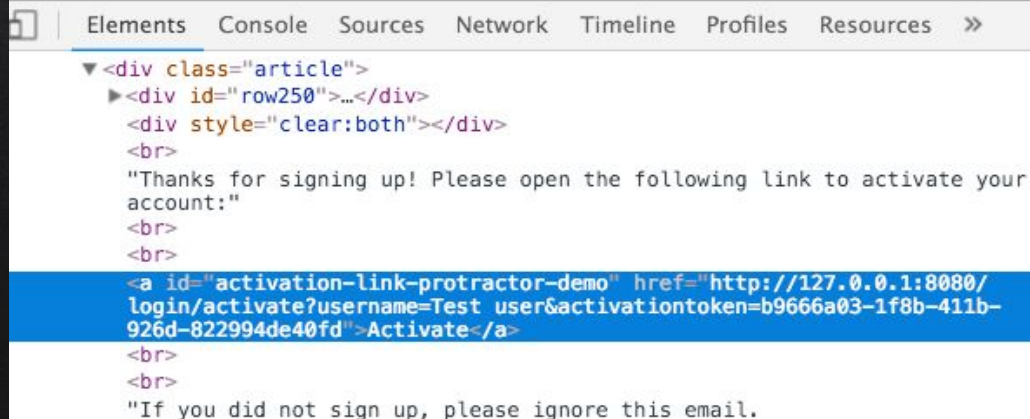
Date: Apr 13, 2016 9:55:10 AM

Subject: Please activate your Just Todo It account

Thanks for signing up! Please open the following link to activate your account:

[Activate](#)

If you did not sign up, please ignore this email.



```
<div class="article">
  <div id="row250">...</div>
  <div style="clear:both"></div>
  <br>
  "Thanks for signing up! Please open the following link to activate your
  account:"
  <br>
  <br>
  <a id="activation-link-protractor-demo" href="http://127.0.0.1:8080/
  login/activate?username=Test user&activationtoken=b9666a03-1f8b-411b-
  926d-822994de40fd">Activate</a>
  <br>
  <br>
  "If you did not sign up, please ignore this email."
```



HOW ABOUT ANGULAR 2?

- Written in TypeScript
- Created similar Todo app in Angular 2
- Wrote some specs for it, works fine!

```
allScriptsTimeout: 30000,  
useAllAngular2AppRoots: true
```




CONTINUOUS INTEGRATION

Requirements:

- App running somewhere
- Job on CI server
- Hosted browser(s) somewhere

[Job details](#)[Tasks](#)[Requirements](#)[Artifacts](#)[Miscellaneous](#)

Tasks

A task is a piece of work that is being executed as part of the build. The execution of a script, a shell command, an Ant Task or a Maven goal are examples of tasks.

You can use [runtime](#), [plan](#) and [global variables](#) to parameterize your tasks.

[Source Code Checkout](#)

Checkout Default Repository

[Script](#)

start coverage session

[Script](#)

Perform resetdb

[Gradle](#)

Protractor testrun against Sauce Labs (Chrome only)

**Final tasks**

Are always executed even if a previous task fails

[Script](#)

end coverage session

[Script](#)

Perform resetdb

[Add task](#)

Gradle configuration

Task description

☐ Disable this task

Executable*

[Add new executable](#)

Script location

Script

(Optional) Defaults to build.gradle.

Tasks



HOSTED BROWSERS





BROWSERSTACK



BrowserStack

Live

Automate

More ▾

Docs ▾

Help ▾

Account ▾

Username and Access Keys



Parallel tests running: 0 / 1

Add more

Project: All



Search builds or sessions

▲ Build : Smoke tests 100

Project: Yunoo.me
Started: about 1 month ago,
Duration: 41 days 9 hrs 44 mins 46 secs

▲ Build : Manual tests 3

Project: Yunoo.me
Started: about 1 month ago,
Duration: 5 mins 22 secs

Build: Smoke tests

DELETE

Project: Yunoo.me

Started: 08:17 UTC 19 Feb 2016

Duration: 41 days 9 hrs 44 mins 46 secs

BrowserStack - Live Web-Based Cross

Browser Testing

Session info: 44 completed, 56 error

Session Matrix

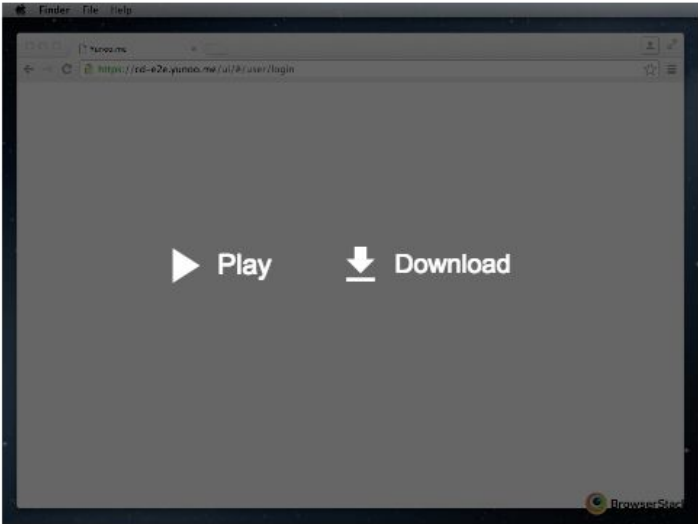
Session	OS	Browser / Device	Duration	Finished
✓ Automated Yunoo.me Google Chrome latest OS X 10.9	🍏 OS X Mountain Lion	🌐 Chrome 49.0	12 mins 25 secs	about 20 hours ago
✓ Automated Yunoo.me Google Chrome latest OS X 10.9	🍏 OS X Mountain Lion	🌐 Chrome 49.0	12 mins 25 secs	about 22 hours ago
✓ Automated Yunoo.me Google Chrome latest OS X 10.9	🍏 OS X Mountain Lion	🌐 Chrome 49.0	15 mins 4 secs	1 day ago
✓ Automated Yunoo.me Google Chrome latest OS X 10.9	🍏 OS X Mountain Lion	🌐 Chrome 49.0	9 mins 31 secs	1 day ago

Session: Automated Yunoo.me | Google Chrome latest | OS X 10.9

DELETE SESSION

Project: Yunoo.me, Build: [Smoke tests](#)

Started 17:49 UTC 31 Mar 2016
Duration 12 mins 25 secs
Status **Completed** (Marked via REST API)
Platform OS X Mountain Lion
Browser Chrome 49.0
Local testing False
User name Luminis Technologies
[Input Capabilities](#) [Browser Capabilities](#)



Text Logs **Visual Logs**

[Raw Logs](#)

Start	Duration	Action	Expand all ▾
00:00	4	Starting Browser	
00:04	0	Setting timeout for asynchronous scripts 20000	+
00:04	0	Configure the amount of time that a particular type of operation can execute for before they are aborted and a <code>TimeoutError</code> is returned to the client.	
00:04	2	Open URL https://cd-e2e.yunoo.me/ui/#/user/login	+

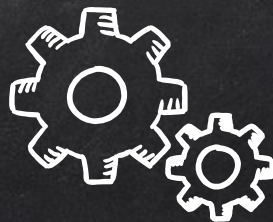
test outside app boundaries is possible

use smart, reusable locators



specs independent of each other

tests are code, so think about test structure



NO MORE EXCUSES GET TESTING!

- Investment pays itself back in the long run
- Even with low test coverage
- Sometimes already while writing the tests



THANKS, ANY QUESTIONS?

Presentation and sources available at:
<https://github.com/Japio007/ProtractorDemo>



Don't forget to vote!