Introduction

My name is Bill Liu and I am the software IT intern. I am currently getting a master’s in computer science at NJIT

Project

My project this summer is building a test automation system

The purpose is to implement a software system that automatically test our website and report any errors or bugs

What is test automation

Tests automation is a system of software that controls and execute test suites then report on the outcome.

Often these tests involve simulating moving, clicking and typing certain things on their browser as if the test is being done manually by a real person.

Why test automation

Test automation provide scheduled reassurances that our web pages and their functions are working properly.

1. high traffic pages such as exhibitions or hours of operations
2. transactional pages such as donations or membership gifts

Significantly reduce the amount of time the developer team spends on testing.

Since our mission as a memorial and museum is so important to so many, we have to be sure our websites are always professional and proper

And you know how advertisements say “with one click of a button?”

Well our system does all the above with NO click of a button!

Contractors sending in their bids

There were Many possible directions we could have taken to build this test system

My first task after I started was to try out these tools and services to find the ones that best fit our needs

Two approaches: User Acceptance Tests and Visual Regression Tests

This model shows the software architecture of the test automation system

It looks pretty technical with weird names like puppeteer but don’t worry

it really boils down to these 2 in red that forms the core of the system

1. one on the right is codeception which runs user acceptance tests
2. and the left is backstopjs which is does visual regression tests

User Acceptance Tests: Catching Errors

Codeception is a full stack testing framework written in PHP programming language

Can control your web browser to perform certain tasks on websites then check if the tasks were completed.

Generates reports showing any errors in the execution and provides snapshots of where the error occurred

User Acceptance Tests Report

This picture shows the report after a successful test run. All green means all good

17 tests and very easy to add more with the established infrastructure

Codeception Video

This is a video shows what it looks like when the system is controlling the browser while performing these tasks. You can tell that the system is mimicking a real user

These tests are being performed on a consistent basis in the background

Visual Regression Tests Report

The second half of our test suite is the visual regression tool called backstopjs

There the purpose is for the program to visually inspect a webpage pixel by pixel for any differences when compared to a reference snapshot

Visual Regression Tests Scrubber

This is a fun tool called the scrubber.

Visual regression Tests video

Here is a brief video of the scrubber

We had an update on the website in July that slightly updated some forms. On the next automated run, My scripts caught the difference and reported to me. Of course, the change you saw are all intentional, but it proves that this system really works.

Automation test report webpage

Finally the test automation system I built spits out reports and posts them automatically on this website.

As you can see we can keep track of every test run we have had so if something goes wrong, you can track exactly when and where it happened.

and once again, NO CLICK OF A BUTTON

Over all this projects helps reduce the intense testing workload whenever there is a website update and eliminate human error during the testing process. Nobody wants to stay up past midnight filling out forms!

What I learned this summer/ summary

These are some pictures I took around the office. they represent the great memories working here this summer.

I got valuable industry experience being part of a development team.

This experience I gained working with test automation will be invaluable in the future

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