National College of Ireland

Configuration Manual

MSc Research Project
Programme Name

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School of Computing
National College of Ireland

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MSc Project Submission Sheet

School of Computing

Student Name: ……. S Teja Pulleti Kurty……

Student ID: ……x22120467……..……

Programme: …… MSc Cybersecurity …… **Year:** ……2023……..

Module: …… Master Thesis ……..……

Lecturer: …… Dr Arghir Nicolae Moldovan ……..……

Submission Due Date: ……14/12/2023……..……

Project Title:…… Security and Privacy Evaluation of Cloud-based Browsers ……..……

Word Count: ……292…… **Page Count:** ……8……..……..……

I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.
ALL internet material must be referenced in the bibliography section. Students are required to use the Referencing Standard specified in the report template. To use other author's written or electronic work is illegal (plagiarism) and may result in disciplinary action.

Signature: …S Teja Pulleti Kurty……

Date: …14.12.2023……

PLEASE READ THE FOLLOWING INSTRUCTIONS AND CHECKLIST

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Assignments that are submitted to the Programme Coordinator Office must be placed into the assignment box located outside the office.

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Configuration Manual

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1 Introduction

The following manual contains how to run the cloud browser and benchmarking as well as fingerprinting tool used in this research.

2 Tools Guide

2.1 How to run cloud browser

Step 1:Open any browser application on a mobile or pc device. Enter the url of the cloud browser service provider. Here KASM and Network Chuck was used(need to create account and subscription fee is applicable) The website will redirect to the dashboard.
Here for example a Chrome browser has been chosen as main browser, inside of which another instance of browser will be run.

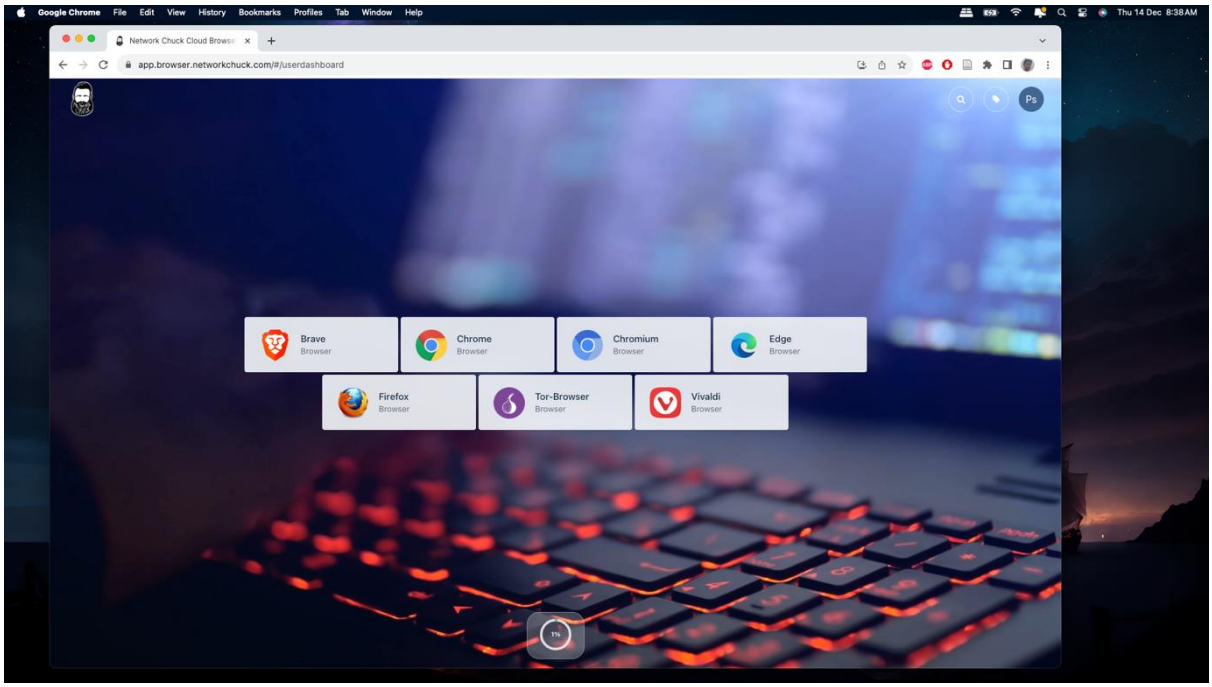


Figure 1. Network Chuck Browser Interface

Step 2. Select any desired instance and click on ‘Launch Session’ Button.

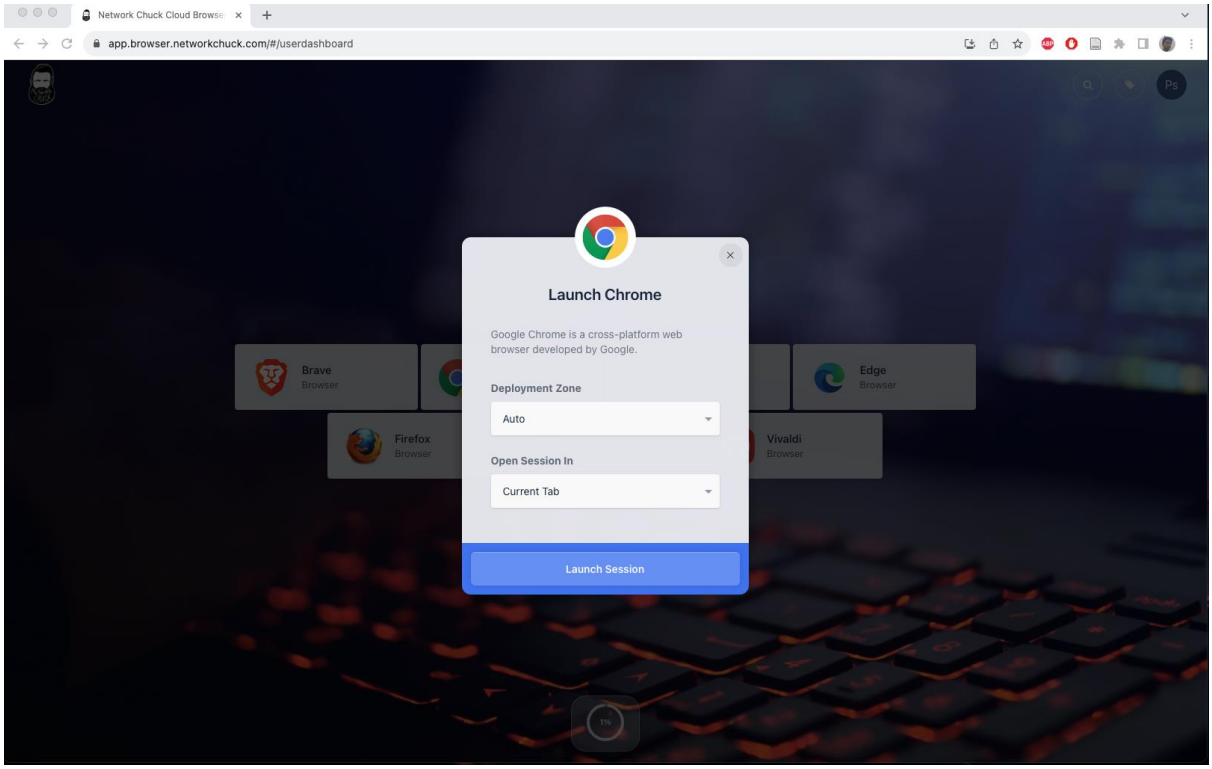


Figure 2. Launching cloud-browser session

Step 3: After clicking launch session a new browser instance will run inside main parent browser, where normal browser operations can be done inside.

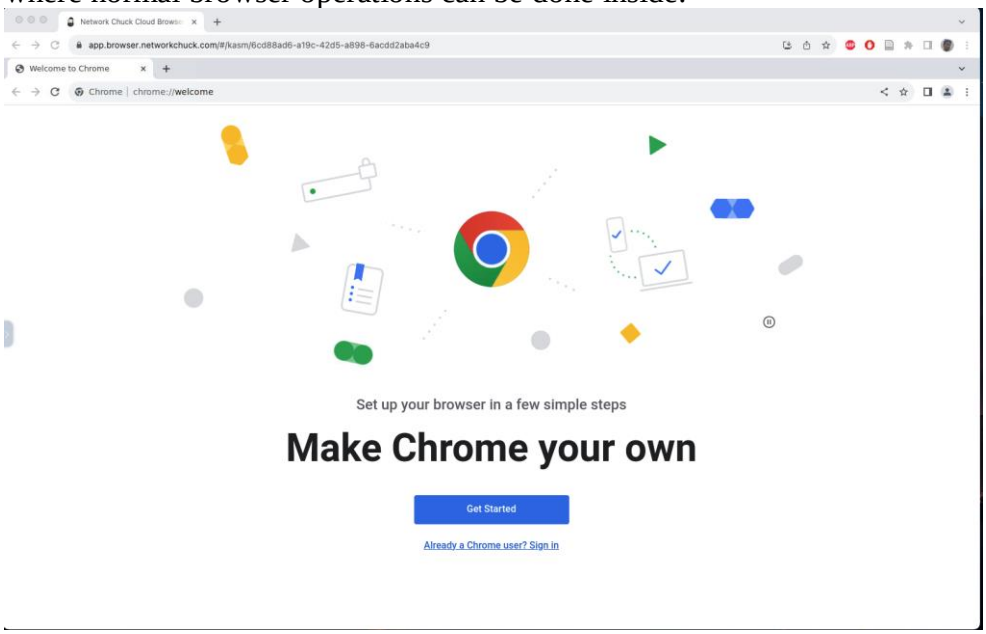


Figure 3. Chrome Browser Cloud Session inside a Browser

2.3 How to perform benchmark and fingerprint tests?

Speedometer

URL Access Link: https://browserbench.org/Speedometer2.0/

Step 1.Just need to click '**Start Test'** on tool interface.

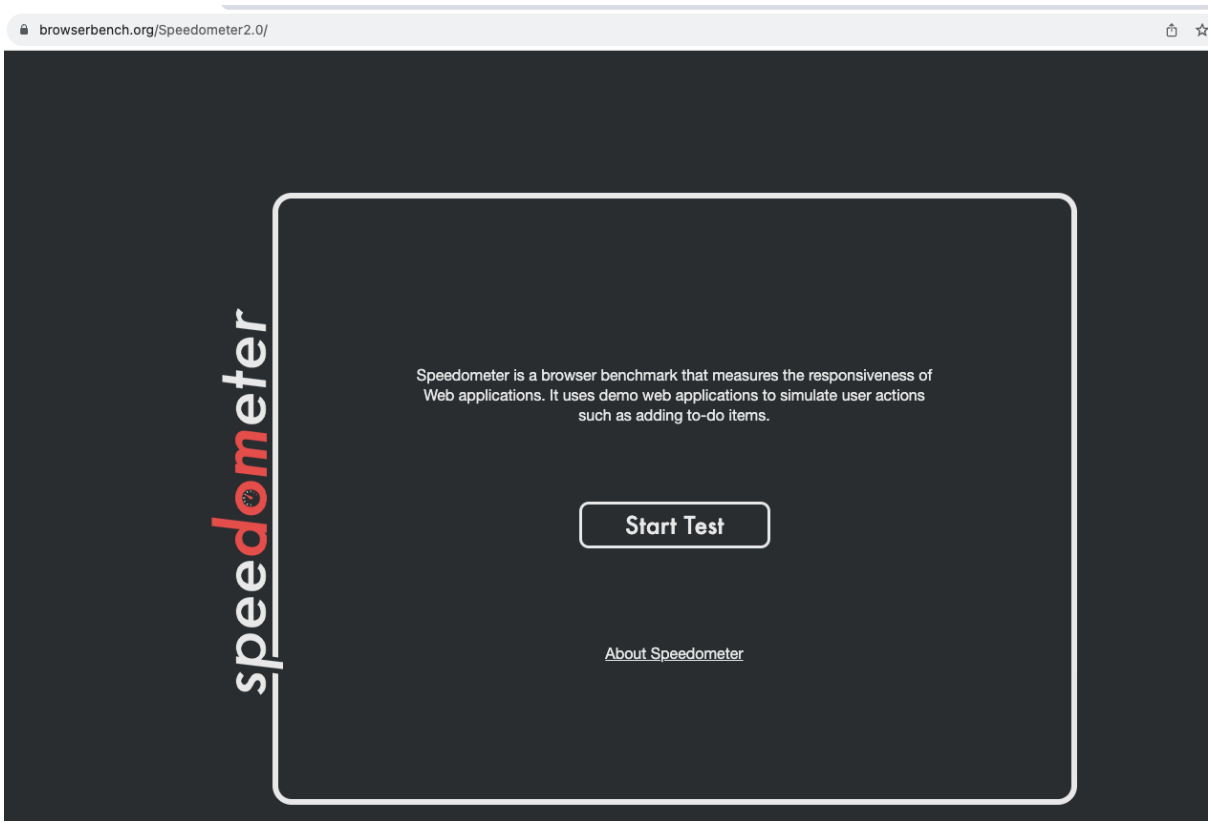


Figure 4. Speedometer Interface

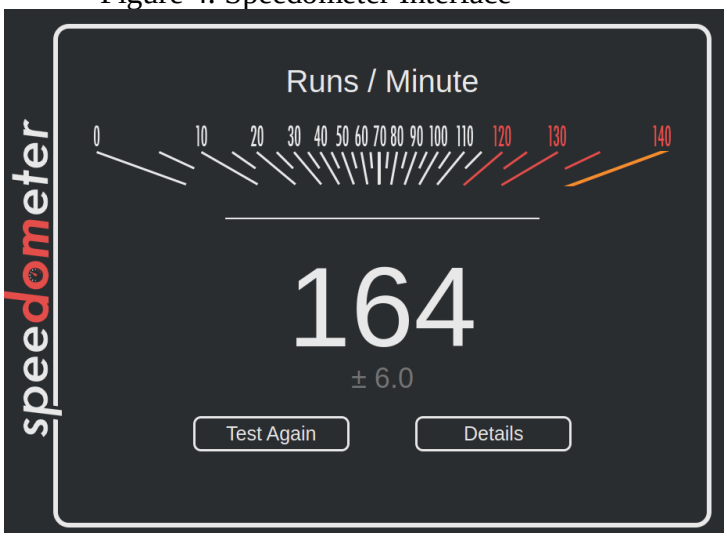


Figure 5. Sample Speedometer Test Result

MotionMark

URL Access Link: https://browserbench.org/MotionMark/

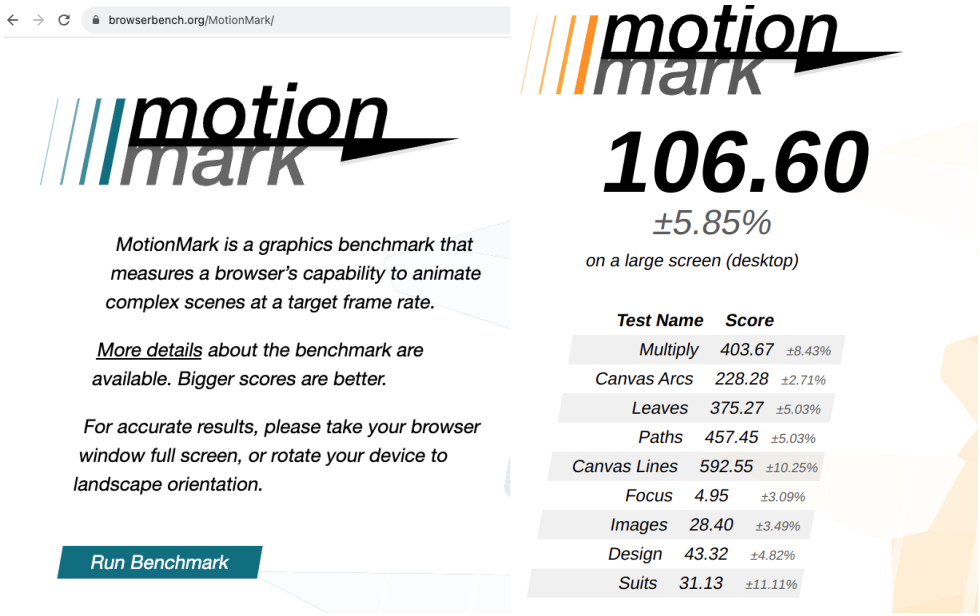


Figure 6. MotionMark UI and Sample test Result

BrowserLeaks

URL Access Link: https://browserleaks.com/

Step 1: Open the given website and select any desired fingerprint metric. The test runs automatically when a specific attribute's link is accessed and the data displayed can be used for analysis

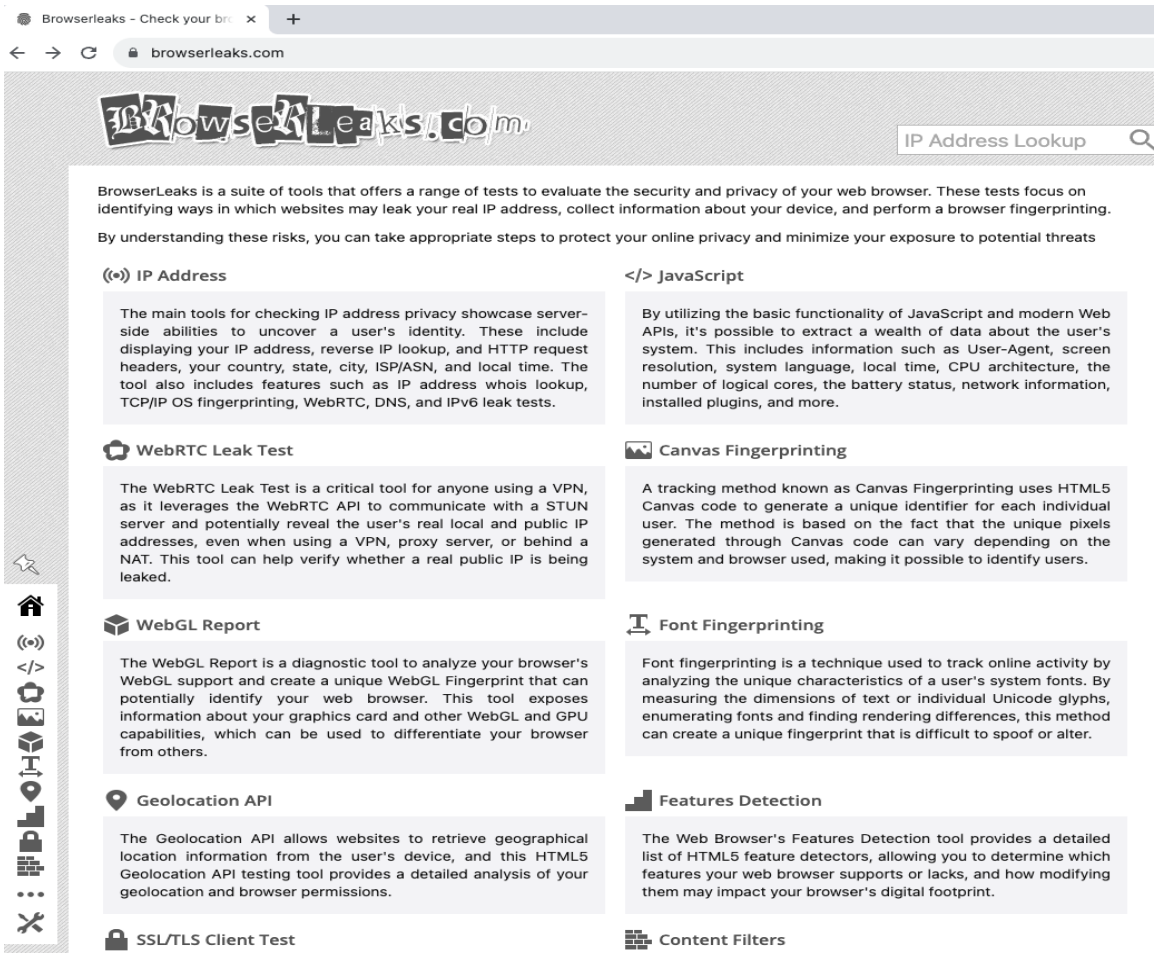
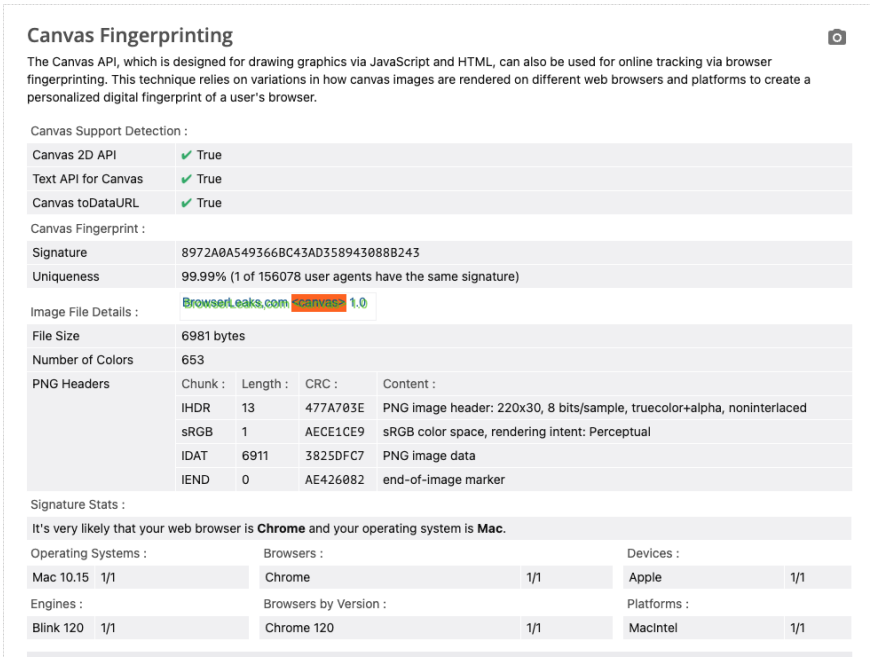


Figure 7.Browse Leaks Home Page



Canvas Fingerprinting

The Canvas API, which is designed for drawing graphics via JavaScript and HTML, can also be used for online tracking via browser fingerprinting. This technique relies on variations in how canvas images are rendered on different web browsers and platforms to create a personalized digital fingerprint of a user's browser.

Canvas Support Detection :

Canvas 2D API	✔ True
Text API for Canvas	✔ True
Canvas toDataURL	✔ True

Canvas Fingerprint :

Signature	8972A0A549366BC43AD358943088B243
Uniqueness	99.99% (1 of 156078 user agents have the same signature)
Image File Details :	BrowserLeaks.com <canvas> 1.0
File Size	6981 bytes
Number of Colors	653

PNG Headers

Chunk :	Length :	CRC :	Content :
IHDR	13	477A703E	PNG image header: 220x30, 8 bits/sample, truecolor+alpha, noninterlaced
sRGB	1	AECE1CE9	sRGB color space, rendering intent: Perceptual
IDAT	6911	3825DFC7	PNG image data
IEND	0	AE426082	end-of-image marker

Signature Stats :

It's very likely that your web browser is **Chrome** and your operating system is **Mac**.

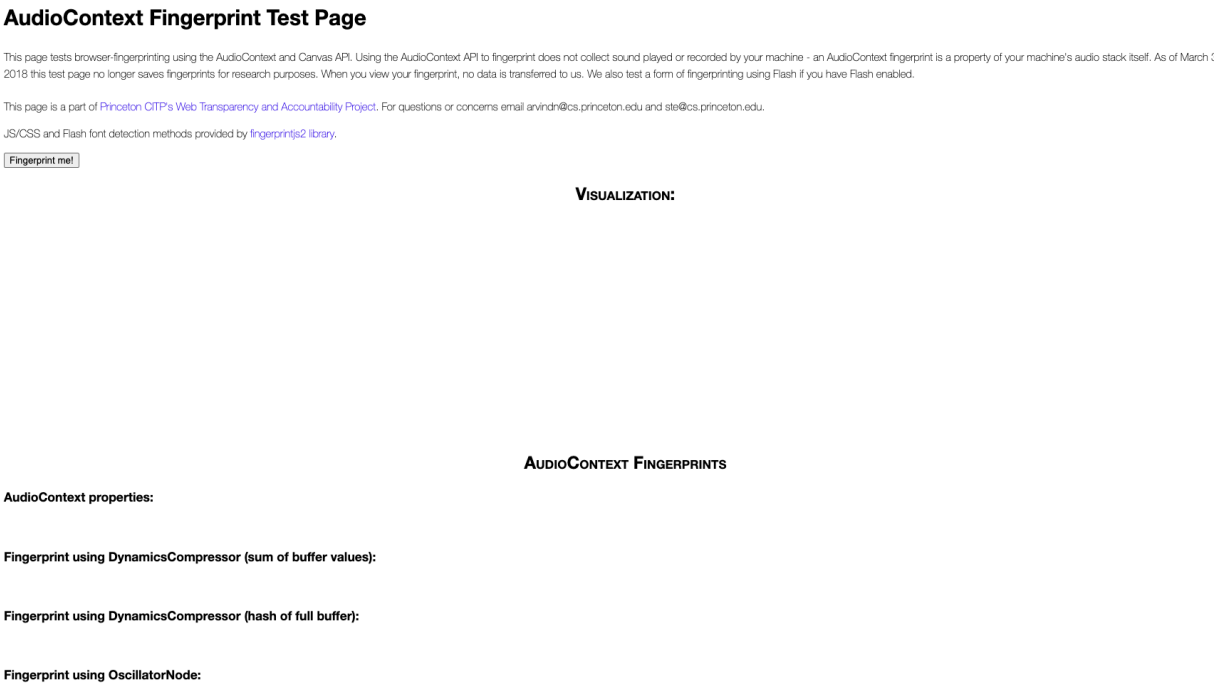
Operating Systems :		Browsers :		Devices :	
Mac 10.15	1/1	Chrome	1/1	Apple	1/1
Engines :		**Browsers by Version :**		**Platforms :**	
Blink 120	1/1	Chrome 120	1/1	MacIntel	1/1

Figure 8. Sample Fingerprint results

AudioContext Fingerprint

URL Access Link: https://audiofingerprint.openwpm.com

Step 1. Need to click on ‘Fingerprint Me’ for the results



AudioContext Fingerprint Test Page

This page tests browser-fingerprinting using the AudioContext and Canvas API. Using the AudioContext API to fingerprint does not collect sound played or recorded by your machine - an AudioContext fingerprint is a property of your machine's audio stack itself. As of March 2018 this test page no longer saves fingerprints for research purposes. When you view your fingerprint, no data is transferred to us. We also test a form of fingerprinting using Flash if you have Flash enabled.

This page is a part of Princeton CITP's Web Transparency and Accountability Project. For questions or concerns email arvindn@cs.princeton.edu and ste@cs.princeton.edu.

JS/CSS and Flash font detection methods provided by fingerprintjs2 library.

Fingerprint me!

VISUALIZATION:

AUDIOCONTEXT FINGERPRINTS

AudioContext properties:

Fingerprint using DynamicsCompressor (sum of buffer values):

Fingerprint using DynamicsCompressor (hash of full buffer):

Fingerprint using OscillatorNode:

Figure 10. AudioContext Fingerprint Webpage

BrowserAudit

URL Access Link: https://browseraudit.com/

Step 1. Need to click on ‘Test Me’ for the results

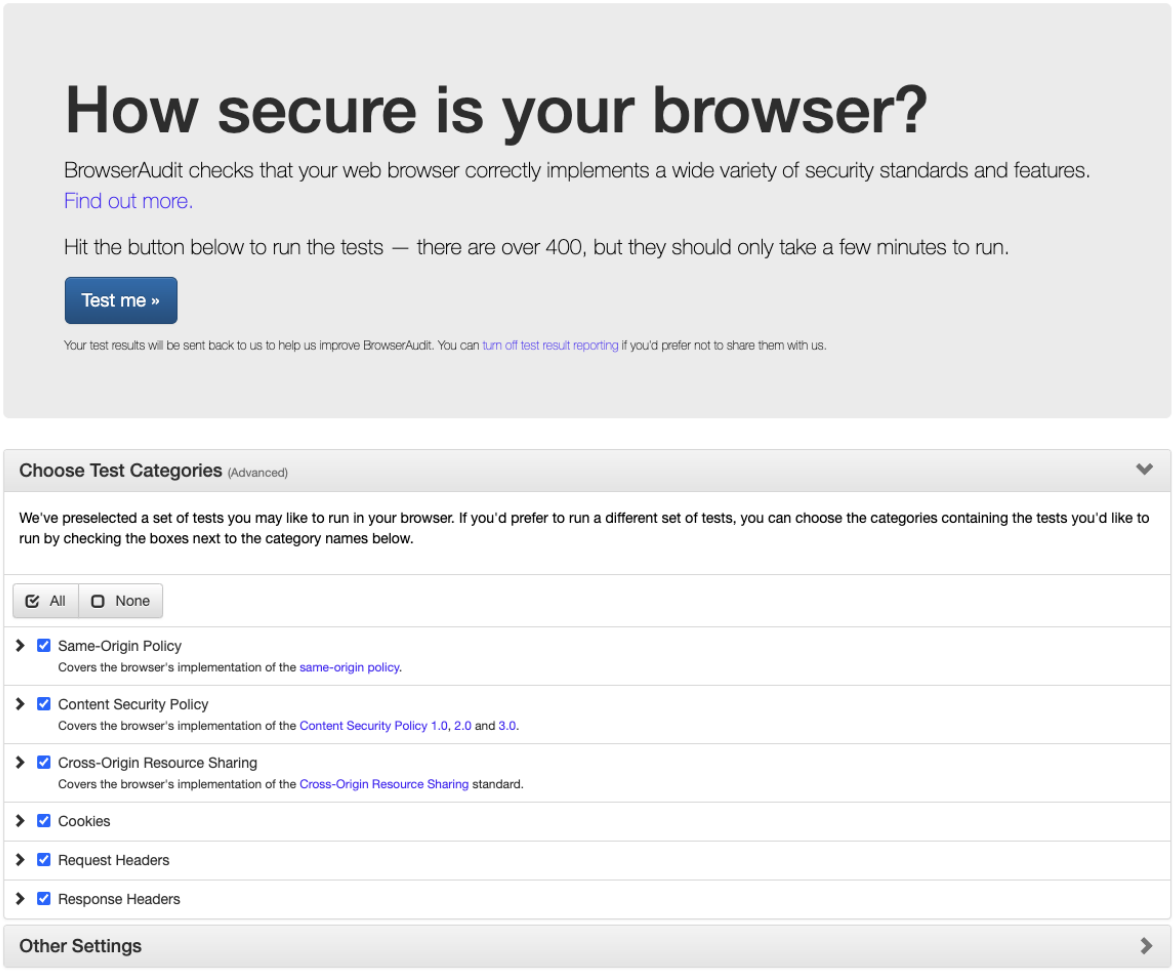


Figure 11. BrowserAudit Homepage

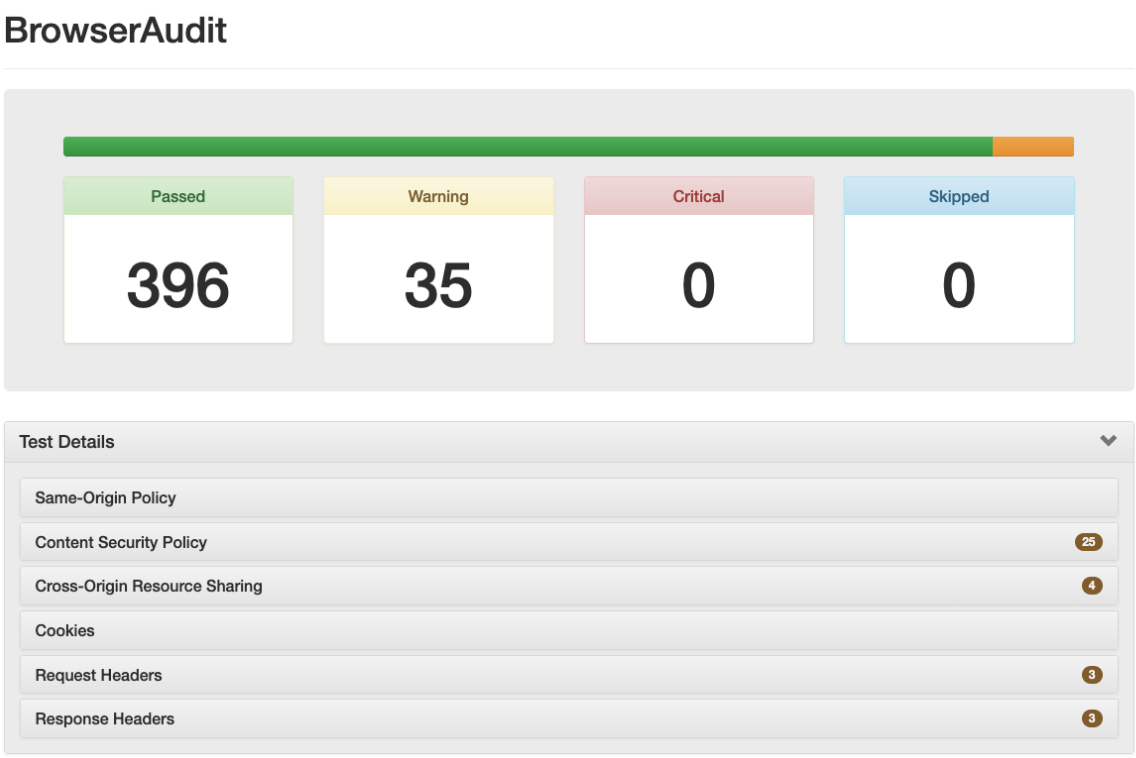


Figure 12. BrowserAudit Sample Test Result