Dark Patterns Buster Hackathon (DPBH 2023)

Round 3 Grand Finale
@IIT(BHU), Varanasi

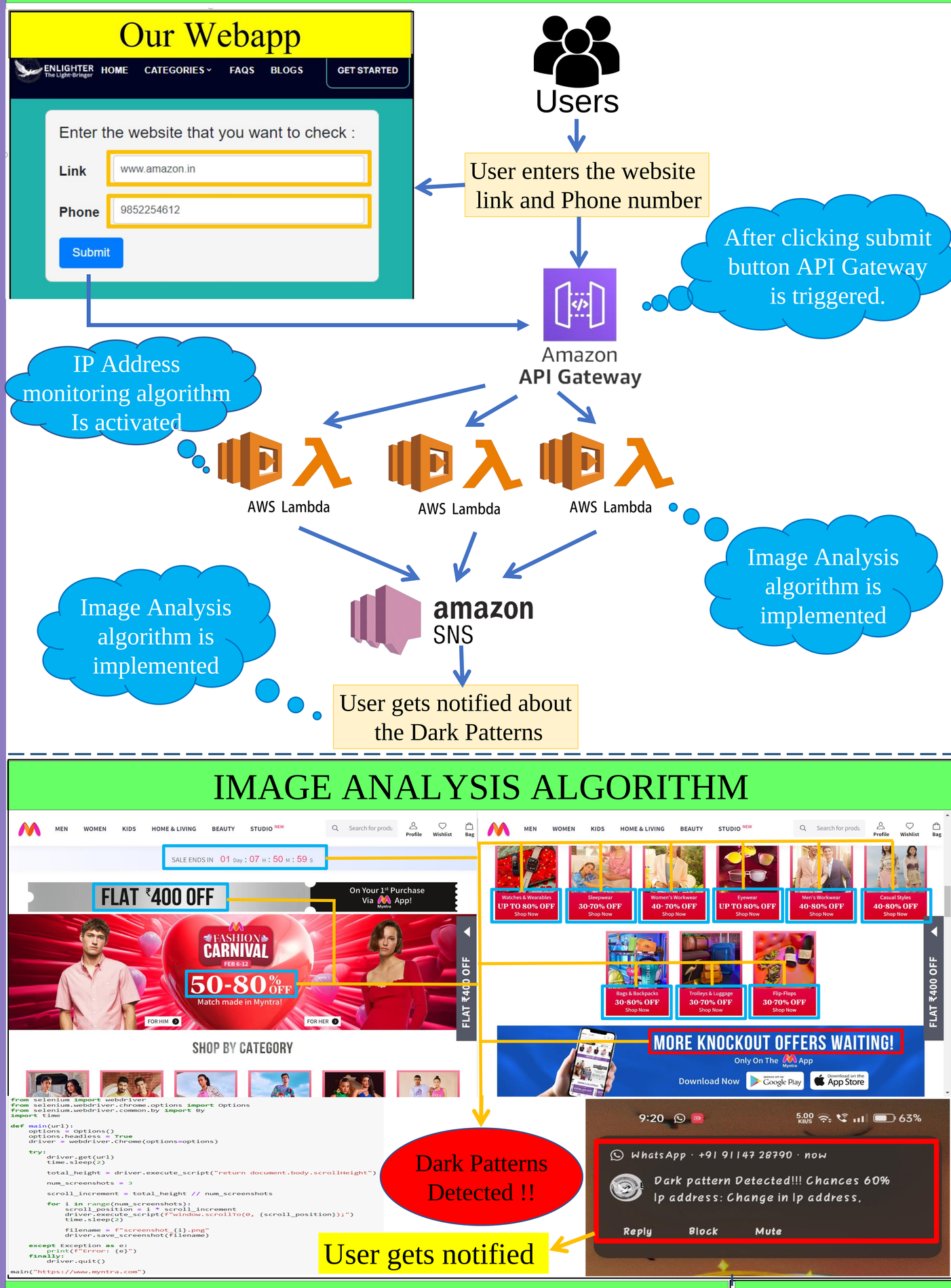
(Feb.17, 2024)

NIST INSTITUTE OF SCIENCE AND TECHNOLOGY, BERHAMPUR, ODISHA

V.LITESH KUMAR
NIKHIL PATNAIK
PARAM JYOTI SAHU
DEEPAK MOHANTY
SILLA SUHANI

ENLIGHTER

WORK FLOW

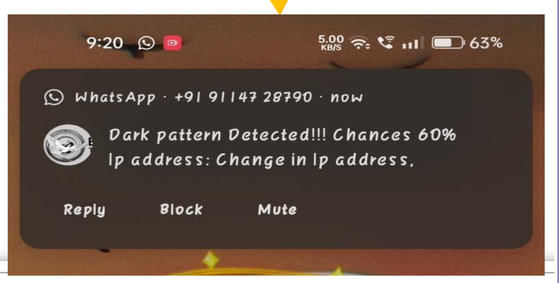


DATA EXTRACTION ALGORITHM

```
    except TimeoutException:
        print("Timed out waiting for page to load")

    finally:
        driver.quit()

if __name__ == "__main__":
    url = "https://www.flipkart.com/"
    get_website_text_and_analyze(url)
```

```
Min. 30% Off
Winter Best Buys
Women's Sarees
Min. 50% Off
Water Bottles & Flasks
Min. 50% Off
Bedsheets
Special offer
Mugs
Min. 50% Off
Hang on, loading content
Top Stories :
Brand Directory
Most searched for on Flipkart:
valentines day gifts
valentines gifts for her
valentines gifts for him
valentines gifts for boyfriend
valentines gifts for girlfriend
Fresh Flowen Delivery
```

DARK PATTERNS DETECTED



[ ]: **The text extracted is given to BERT model.**

User gets notified

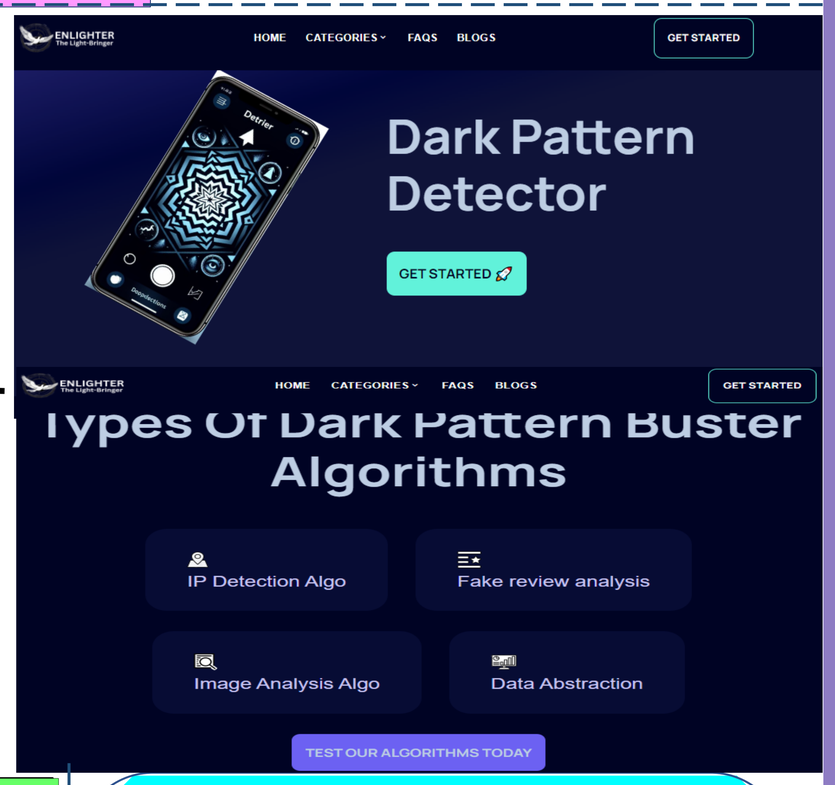
IMAGE ANALYSIS ALGORITHM


```
from selenium import webdriver
from selenium.webdriver.chrome.options import Options
from selenium.webdriver.common.by import By
import time

def main(url):
    options = Options()
    options.headless = True
    driver = webdriver.Chrome(options=options)

    try:
        driver.get(url)
        time.sleep(2)

        total_height = driver.execute_script("return document.body.scrollHeight")

        num_screenshots = 3

        scroll_increment = total_height // num_screenshots

        for i in range(num_screenshots):
            scroll_position = i * scroll_increment
            driver.execute_script(f"window.scrollTo(0, {scroll_position});")
            time.sleep(2)

            filename = f"screenshot_{i}.png"
            driver.save_screenshot(filename)

    except Exception as e:
        print(f"Error: {e}")
    finally:
        driver.quit()

main("https://www.myntra.com")
```

Dark Patterns Detected !!

User gets notified

USER INTERFACE



ESTIMATED COST

- AWS Lambda Services : 16.62 INR per 1M requests.
- AWS API Call : 87.27 INR per 1M requests.
- AWS SNS Services: 41.56 INR per 1Mnotification.
- Maintenance Cost: 1000 INR per month.
- **Total cost of our webapp** is **1500 INR** /month.

TECH STACK

HTML, CSS, JS, python, Selenium, aws, Amazon API Gateway, amazon SNS, AWS Lambda, Python Beautiful Soup

Targeted Dark Patterns

- Fake Urgency
- User Interface Trickery
- Fake Reviews

Contact: 9664249184
V.Litesh kumar
vkb021@nist.edu

© All rights reserved

ENLIGHTER The Light-Bringer

Dr. N. S Rajput
Convener, DPBH-2023
Email:dpbh2023@iitbhu.ac.in

उपभोक्ता मामले विभाग
DEPARTMENT OF
CONSUMER AFFAIRS
सत्यमेव जयते

G20 भारत 2023 INDIA

Dark Patterns Buster
Hackathon 2023

Azadi Ka Amrit Mahotsav

Abstract

Enlighter is a user-friendly web application designed to identify and analyze dark patterns within e-commerce platform websites. Featuring a simple interface, it empowers users to easily detect and evaluate these deceptive design practices, facilitating a more transparent and informed online experience.

Enlighter identifies and tackles numerous dark patterns: **Scarcity**, **Misleading Discount Claims**, **Subscription Tricks**, **Hidden Fees** , **Tricky Opt-In/Opt-Out**, **False Social Proof**, **Difficulty in Unsubscribing**, **Bait-and-Switch**, **Misleading Copy** and **Manipulative Design Elements**.

Enlighter addresses the issue of dark pattern detection by using two methods to provide a reliable and accurate solution.

We have employed two algorithms to detect dark patterns in an e-commerce website. One of the algorithms is for text extraction, where **beautifulsoup** and **selenium** are utilized as tech stack to provide relevant and accurate results by effectively recognizing dark patterns...

Another algorithm is for image analysis where the screenshot of the entered website (by the user) is taken out by using **Selenium** and this screenshot is analyzed using **OCR** (Tesseract) framework for detecting the presence of dark patterns.

Enlighter's special feature is that, unlike mobile apps, which must be downloaded, it doesn't need to be downloaded. Moreover, since it is easily available through mobile devices, none of the Chrome extensions—which are required for laptops and desktop computers—are needed.

Enlighter just requires two inputs from the user: the website to be used for dark pattern recognition, and the user's mobile number to notify the user about the existence or lack of dark patterns on the entered website.

Enlighter is scalable, cost-effective and user-friendly in nature. It handles up to 1 million requests with seamless efficiency.The total cost of our web app is **1500 INR** only.

Team Members

Team Leader
DevOps Specialist
Architect Design

Team Member
Web Developer
Frontend Design

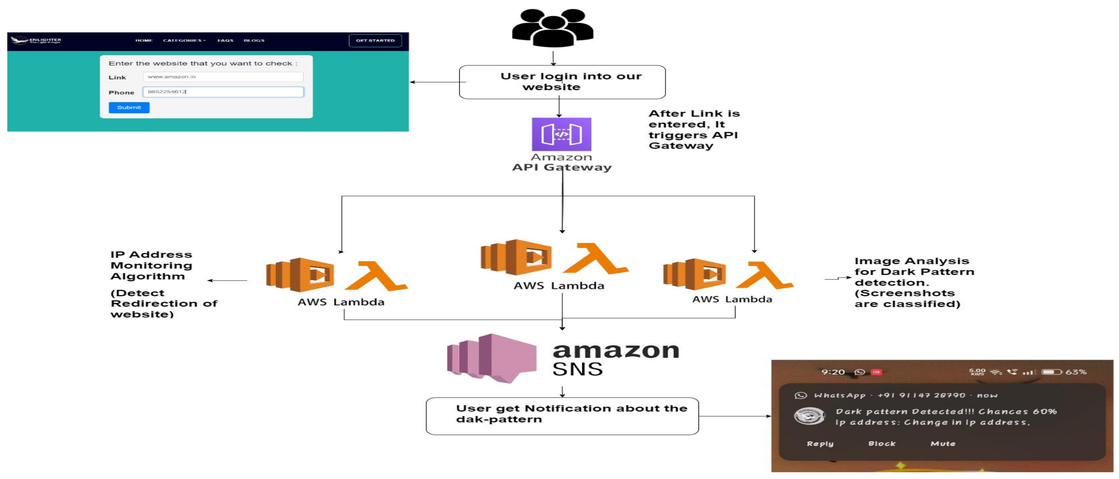
Team Member
AI/ML Developer
Backend Design

Team Member
Data Science
Algorithm Design

Team Member
Machine Learning
Algorithm Design

Impact Assessment & conclusion

For text extraction in our research, we have used beautifulsoup and Selenium. OCR has also been utilized by us to extract text. Enlighter became more dependable and accurate when text extraction was done using both of these methods. Tricking consumers into making undesirable or damaging decisions while interacting with websites is known as dark patterning. The Dark Pattern Prevention Initiative was started by the Indian Ministry of Consumer Affairs to shield consumers' rights and privacy from these kinds of abuses. Enlighter has a capability to reach masses and handle a large number of requests and it has no limitations. Our web app can be used by the users effectively as there is no entry barriers .

Solution highlights

- Scalability: Handles up to **1 million requests** with seamless efficiency.
- Cost-Effective: Resources used come at a minimal cost, totalling just **1500 INR**.
- Device Compatibility: Adaptable design ensures functionality on laptops and mobile devices.
- User-Friendly Access: Accessible to users without laptops, eliminating downloads and login/signup processes.
- Simple Input Requirements: Users only need to provide a website and an optional phone number.
- Automated Reporting: Delivers a comprehensive dark pattern analysis report via SMS upon submission.