

Offline Human Attention Mapping Tool

Problem Statement:

Build an offline system that maps human attention patterns using interaction signals without measuring productivity or surveillance.

Best Tech Stack (Python):

- GUI: Tkinter
- Tracking: pynput
- Data Analysis: pandas
- Visualization: matplotlib
- Storage: CSV

Features:

1. Track mouse movement
2. Track clicks
3. Track keyboard activity
4. Detect idle time (>10 sec inactivity)
5. Generate Focus vs Idle report
6. Display attention heatmap

Installation:

```
pip install pynput pandas matplotlib seaborn
```

Project Structure:

```
attention_mapper/
    main.py
    tracker.py
    analyzer.py
    report.py
    data/session.csv
```

Sample Code (Tracker Module):

```
# tracker.py

from pynput import mouse, keyboard
import time
import csv

def log_event(event_type, x, y):
    with open("session.csv", "a", newline="") as f:
        writer = csv.writer(f)
        writer.writerow([time.time(), event_type, x, y])

def on_move(x, y):
    log_event("move", x, y)

def on_click(x, y, button, pressed):
    if pressed:
        log_event("click", x, y)

def on_press(key):
    log_event("key", 0, 0)

mouse.Listener(on_move=on_move, on_click=on_click).start()
keyboard.Listener(on_press=on_press).start()
```

Expected Output:

Output:

- Total Session Time
- Idle Time
- Focus Time
- Mouse Heatmap
- Activity Graph

This project demonstrates behavioral interaction mapping without productivity scoring or surveillance judgment.
Fully offline and privacy-first design.