HTX OBJECT FAMILIARITY DETECTION SOFTWARE

SUMMARY

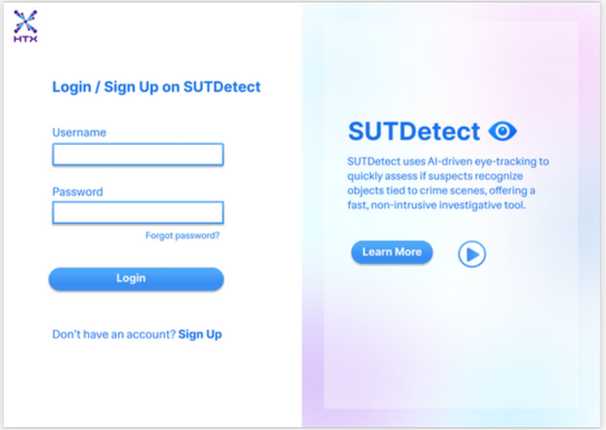
Led a team of 6 in designing and developing custom software for HTX, aimed at assisting Home Team departments in determining a suspect's familiarity with specific objects through eye-tracking technology.

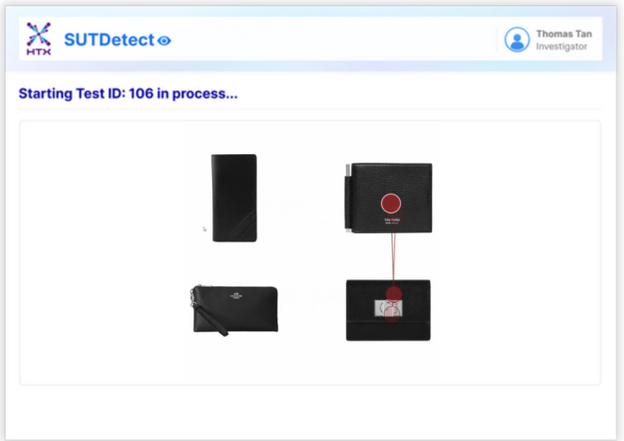
The goal was to create a deployable, non-invasive AI solution to improve investigative accuracy and operational efficiency.

Role: Team Leader, UI/UX Designer, Data Analyst
Timeline: August 2024 – May 2025

Key Results

- Conducted extensive data cleaning
- Developed machine learning models for familiarity detection, accuracy reached 70%
- Initiated a novel research area on object-based familiarity detection





DEFINING THE PROBLEM

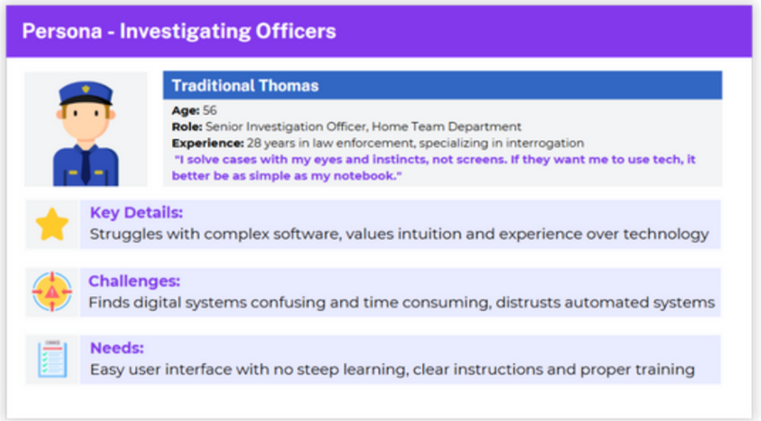
To address our problem statement:

How might we detect object familiarity in suspects during investigations covertly?

The team utilized design thinking methods and carried out user interviews.

Process: User Interviews

We interviewed various users - from HTX to officers to gain their insights and created personas to pinpoint their needs.



Identified Opportunities:

Users prefer using a system that has familiar user interface - like the current systems being used instead of learning a new software

Utilize eye tracking technology that is contactless and covert

THE MVP

Following the opportunities identified, we then decided on the Minimum Viable Product for our project

- **Home page**
- Image Upload
- Eye tracking test page
- Dashboard

HOME PAGE

To allow users to click on the profile of the suspect they wish to begin the test for, the home page was necessary to display suspect's information for easy viewing of their results and details.

User Interface is similar to the current system deployed.

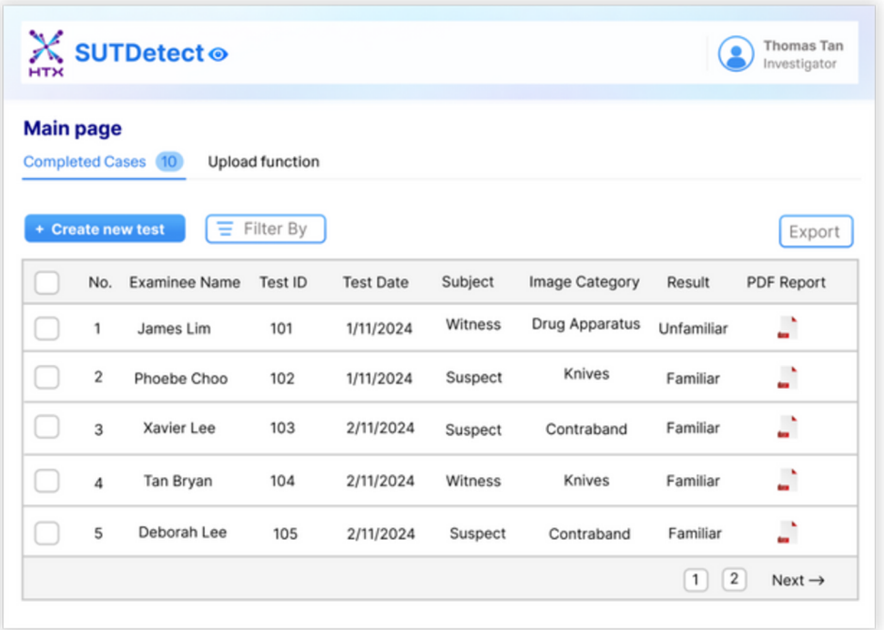


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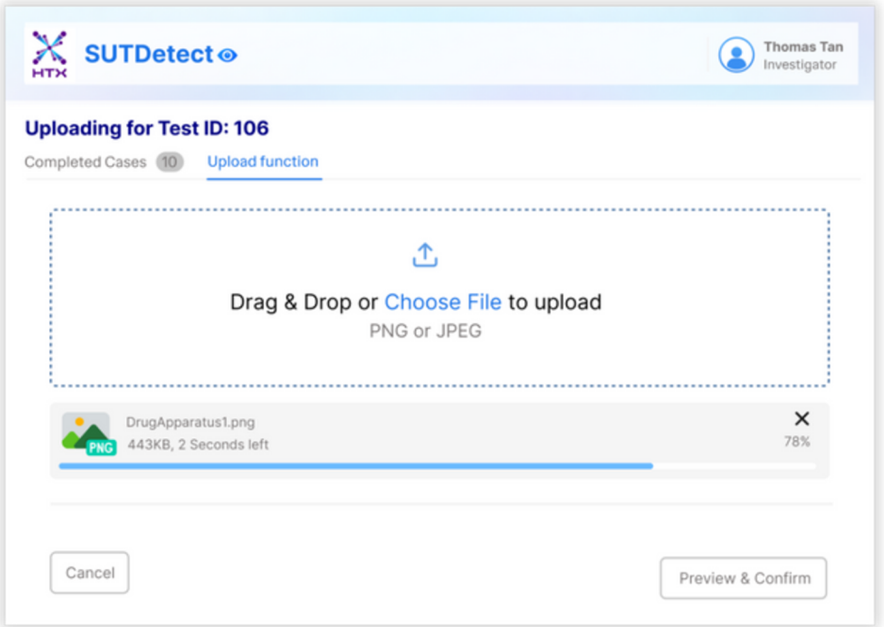
IMAGE UPLOAD

Users can upload customized images tailored specifically to each suspect, ensuring flexibility in testing object familiarity based on individual investigative scenarios.



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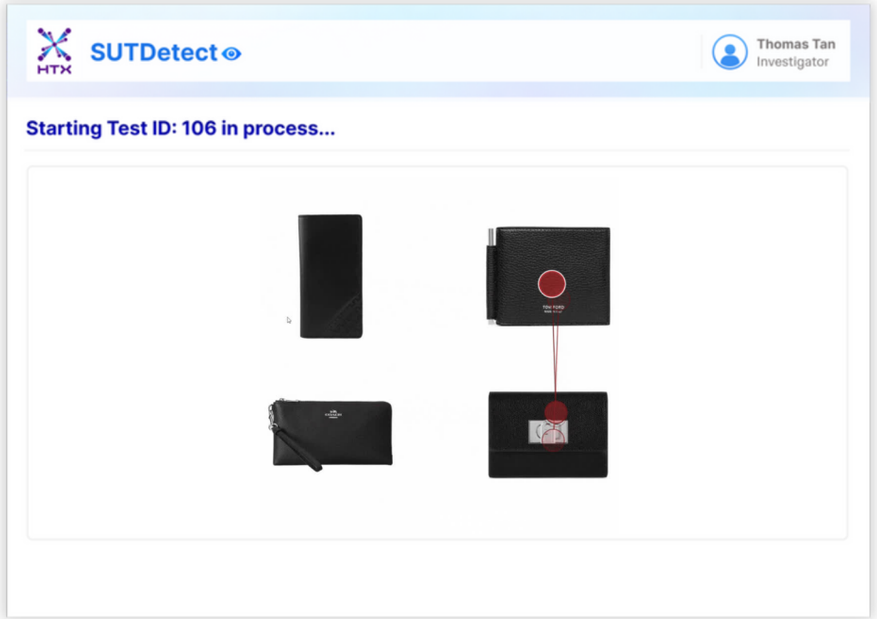
EYE TRACKING TEST

Users can administer the eye tracking test for each suspect, and observe their eye movements when they gaze over their familiar objects.



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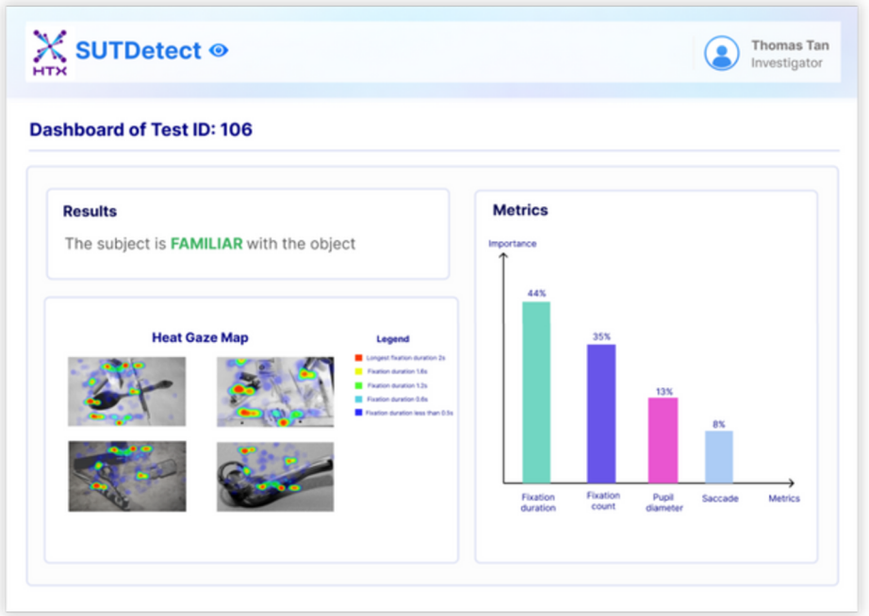
DASHBOARD

After users are done with their tests, the dashboard will display the user's results - whether the suspect is familiar or unfamiliar with an object.

The metrics of each variable will be displayed to assist the users into understanding which metric contributes the most significantly to the results. A heat map will also be displayed for visualization of the gaze pattern.



NEXT STEPS

The team is currently integrating the custom software with an external eye tracking software, Tobii. A research paper detailing the results of our study and the value proposition of our project is also in the works.

VALUE PROPOSITION

This project addresses existing gaps in eye-tracking research by specifically focusing on object familiarity detection, providing deeper insights into gaze behaviors toward objects. It delivers a fully integrated solution tailored to user needs, offering an intuitive user interface designed for ease of use and minimal learning curve, eliminating the need to switch between external software platforms.