

Where is the missing person?



Pariya Samandi (UID: 205-092-357)

Stewart Dulaney (UID: 904-064-791)

December 03, 2019

Drones



Drones are an increasingly common sight and, outwardly, this one is no different



The drone has a flashing blue light to alert people to its presence



A search needs two police officers: one to fly the drone, the other to use the recognition software.

Introduction

- Scotland Police has revealed an aerial drone system to find missing people
- It uses advanced technologies like highly-powered optical cameras, neural networks, thermal imaging sensors, and Internet of Things devices.

Introduction

- The low cost drone uses can be operated by two people, one for flying the drone and another one for using the recognition software (Macdonald).
- The program falls short in preserving privacy by failing to protect potentially sensitive data captured.

Usability


- The RPAS is capable of gathering data in real-time
- RPAS is both technology-centered and user-centered.
- Designers have considered the end-user (human) needs per Nielsen's usability Heuristic Evaluation (HE)

Nielsen's Heuristics for Expert Evaluation

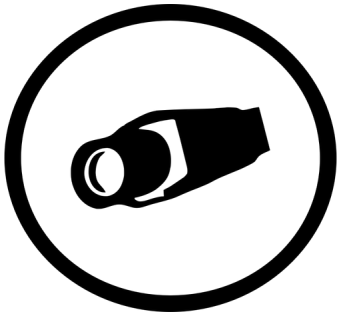

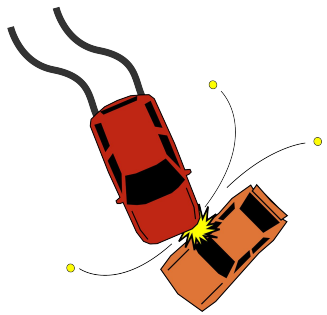
#	Heuristic	Description
1	Visibility of system status	<ul style="list-style-type: none">• Keep users informed about system status• Provide feedback about system status
2	Match between system and the real world	<ul style="list-style-type: none">• Speak user's language• Follow real-world conventions• Make information appear in natural and logical order• Clearly marked "emergency exit" should be provided for a user who might choose a system function by mistake
3	User control and freedom	<ul style="list-style-type: none">• Supports undo and redo
4	Consistency and standards	Follow platform conventions and accepted standards by having consistent meaning of words, situations or actions in different contexts
5	Error prevention	<ul style="list-style-type: none">• Make it difficult to make mistakes• A careful design that prevents a problem from occurring in the first place is better than a good error message
6	Recognition rather than recall	<ul style="list-style-type: none">• Make objects, actions and options visible• Reduce memory load
7	Flexibility and efficiency of use	<ul style="list-style-type: none">• Allow users to tailor frequent actions• Provide shortcuts (accelerators) for performing frequent tasks would speed up the interaction that the system can cater to both novice and experienced user
8	Aesthetic and minimalist	Dialogs should not contain information that is irrelevant or rarely needed
9	Help users recognize, diagnose and recover from errors	Provide good error messages;(1) should be expressed in plain language (no codes), (2) precisely indicate the problem, and (3) constructively suggest a solution
10	Help and documentation	Provide help and documentation; (1) should be easy to search, (2) focus on the user's task, (3) list concrete steps to be carried out, and (4) not to be lengthy

Applications - Police Scotland

- In addition to finding missing persons:

		
Crime Scenes	Unsafe Situations	Events

Applications - Broader Law Enforcement

 The White House logo, featuring a blue oval with a white silhouette of the White House building and the text "THE WHITE HOUSE WASHINGTON" below it.	 A black and white icon of a flashlight, with the beam pointing to the right, enclosed in a black circle.	 A black and white icon of a telephone handset, with the letters "SOS" in white on a black background, enclosed in a black rounded square.	 A colorful illustration of a house with a red roof and brown walls, with large orange and yellow flames coming out of the windows and roof.	 A colorful illustration of a red car and an orange car crashing into each other, with yellow sparks and smoke coming out of the impact point.
Safeguard VIP's	Detect Crime	Evaluate Disasters	Detect Hotspots	Car Accidents

Applications - Many More

Sensors - Police Scotland	Add'l Sensors or Tools
<ul style="list-style-type: none">● Daytime video camera● Thermal image camera	<ul style="list-style-type: none">● Air quality sensors● Pepper spray● Cell phone trackers● Etc

Privacy - The Good

United
Kingdom



GDPR



Data
Protection
Impact
Assessment

Privacy - Flow of Personal Data



```
graph LR; Camera --> Radio; Radio --> SD_Card[SD Card]; SD_Card --> CD
```

Camera

Radio

SD Card

CD

Privacy - The Bad

1	No encryption	×
2	No auditable access logs	×

Thank You