SMART CITY CHALLENGE 2025
Solution idea for the city challenges

Solution Idea Title: SafeCitAI – AI-powered safety toolkit for public spaces

Planned pilot project duration – 24 months

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1. The challenge: (women's) safety in public spaces (Amsterdam, the Netherlands)

For women, girls, and gender diverse people, urban public spaces do not always feel safe, especially at night. Perceived safety, or the feeling of safety, is an emotional response arising from individuals' subjective assessment of their security or potential threats [1], [2]. Moreover, there's little evidence that perceived safety is related to actual safety or to crime levels within a specific urban area [3]. Nevertheless, perceived safety has a profound impact on women's use of public spaces and mobility – it can affect their daily activities and travel behaviour, and limit their spatial mobility, directly influencing their well-being and quality of life [2].

Women's perceptions of safety are complex and multifaceted, shaped by an interplay of diverse factors. The exisitng body of scholarly literature suggest three main groups of factors: (1) environmental factors or design and quality of the built environment (e.g., visibility, lighting, vegetation, street and public space maintenance, openness & connectivity, formal surveillance); (2) individual factors (e.g., age, gender identity, socioeconomic status, health); (3) social factors (e.g., ethnicity, familiarity with the place, presence of others, prior information, social incivilities) [1], [2], [3]. All these factors are amplified at nighttime when public spaces feel generally more unsafe. Put simply, the most feared scenario for a young woman would be to travel back home at night alone through an unfamiliar part of the city, taking poorly lit, long and desolate pathways with limited access points and encountering a group of intoxicated individuals exhibiting unruly behaviour.

EU countries are generally considered safe for women and low-crime. Yet, every city has areas or neighbourhoods that feel less safe or are considered unsafe. Some areas are perceived as safe during the daytime, yet become unsafe at night. Creating a sense of safety and improving actual safety in such areas is imperative for enabling women and girls to take an active part in urban life during daytime and nighttime. It also has a reinforcing effect – the more women use public spaces, the more they will feel comfortable and safe in those public spaces.

2. The solution: AI-powered safety toolkit for public spaces

Our solution aims to address actual and perceived safety in urban settings deemed unsafe, especially at nighttime. We aim to employ state-of-the-art AI CCTV surveillance solutions, mobile (using security drones) or static, in combination with real-time human activity recognition (HAR) algorithms to enable accurate and quick response from the local police. Depending on the urban setting, the solution can be adjusted to the local conditions. For example, the City of Amsterdam is especially concerned about the safety on long, desolate bicycle
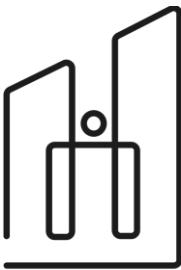
paths on the city outskirts that connect event venues with residential areas. These paths typically have one entry and one exit point with limited or no surveillance. In this situation, we propose setting up a sensor-activated system that would launch security drones with AI-powered CCTV surveillance capabilities if a person using the path doesn't reach its endpoint or control point within an estimated time period.
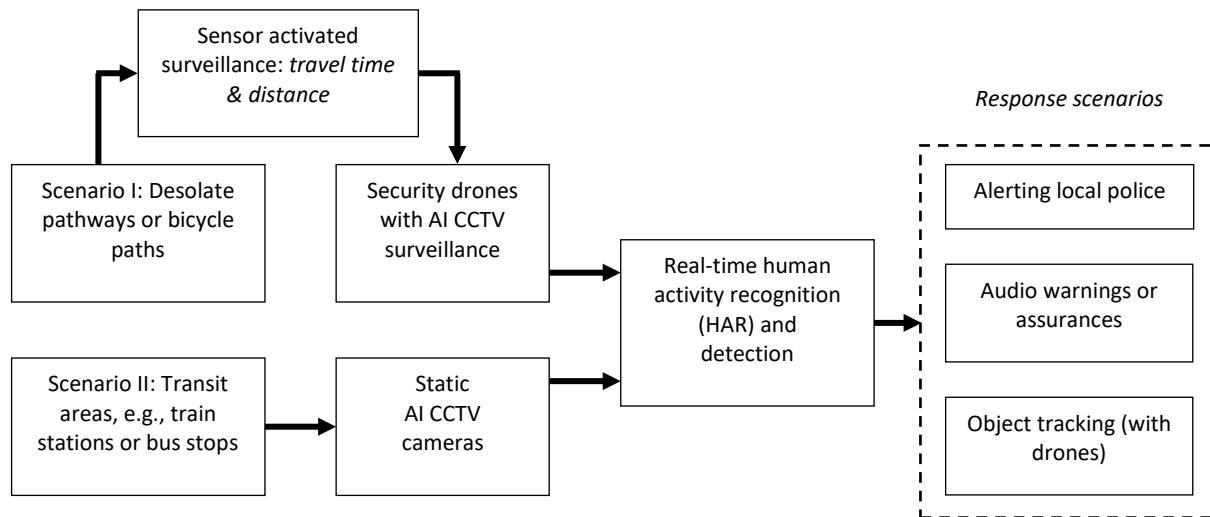

In other cities (e.g., the City of Vantaa in Finland), train stations are often considered unsafe, especially at night. In this scenario, static AI CCTV cameras could be a preferred option for surveillance. The AI CCTV cameras, both mobile and static, enable human activity recognition and real-time situational assessment, which can trigger alerts if needed. Additionally, drones can be equipped with pre-recorded audio warnings to interrupt an attack or, conversely, reassure lonely walkers or cyclists of their safety.

The use of surveillance to improve the sense of safety in public spaces shows mixed results in the existing literature. If the presence of police or security personnel typically increases the perceived safety [1], [2], the effects of CCTV on safety perceptions are more varied. Consequently, it will be crucial to co-design awareness-raising and communication mechanisms to inform users in the pilot areas in a positive, reassuring way that local authorities have implemented additional safety measures to make public spaces more secure.

Finally, special attention also needs to be paid to data privacy and ethics. Additional surveillance can cause concerns among locals due to data privacy and cybersecurity risks. We plan to establish robust data governance frameworks and transparency to help protect against the improper use or sharing of sensitive data, as well as the collection and storage of unnecessary personal data.

3. Innovation and piloting of the solution

There are many solutions that aim to address the challenge of safety in public spaces. The majority of solutions take the form of a 'safety app' (e.g., SafetiPin, WalkSafe, SafeZone). Their functionalities vary, but generally the existing solutions aim to provide a mobile app to (1) crowdsource information about different urban areas and provide safety audits or safer routes, (2) track journeys and share real-time with your trusted people, (3) provide quick access to information about the nearest safe places, or (4) quick and discreet way to alert police or other
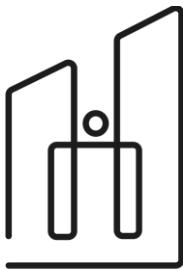
emergency contacts. All these solutions operate under the assumption that a user has a working smartphone with an internet connection and can use it in times of distress. Moreover, the uptake and use of such apps show mixed results and impacts on perceived or actual safety.

Our solution aims to support any person using public spaces by ensuring their safety through AI-powered CCTV and HAR. The AI CCTV solutions are already used to deliver advanced analytical functions like vehicle detection, face detection, people counting, traffic counting, and license plate recognition (LPR). Some European cities have begun testing artificial intelligence components in CCTV systems, e.g., the Intelligent Monitoring and Analysis System in Katowice, confirming the effectiveness and legitimacy of these solutions [4]. Therefore, we see it as an opportunity to leverage new technologies to augment existing CCTV systems, improve the efficiency of local law enforcement, and, consequently, enhance the sense of safety in currently 'unsafe' places.

Although a smartphone would be the preferred tool for communicating with users, we do not foresee a need for a mobile app and aim to use SMS, signage indicating areas under AI CCTV surveillance, and other available communication tools. We expect pilot cities to designate specific areas or pathways for solution testing and to co-design implementation scenarios in line with local conditions and needs. It will be important to establish close collaboration with the city and the local police, as well as engage local women, to ensure that the proposed solution is tailored to the specific localities and their sociocultural contexts.

4. Expected impact of the solution

The expected impact of the SafeCitAI solution is to make public spaces safe for all, not just for women. In practical terms, we aim to develop a solution that supports local law enforcement in delivering more efficient, rapid responses to disturbances in public spaces, thereby reducing overall crime rates in the city and creating a greater sense of safety among residents. Improved safety will, in return, improve urban life after dark, especially for women and other vulnerable groups. It offers new economic, cultural and social opportunities for the nighttime economy and a more lively urban nightlife. Furthermore, by creating safer cities for women, we are improving the quality of life of women, girls, and gender-diverse people by reducing barriers to their spatial mobility and activities.

References:
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