Probabilistic AI in Criminal Justice: Mapping the Ecosystem and Scoping for the Future

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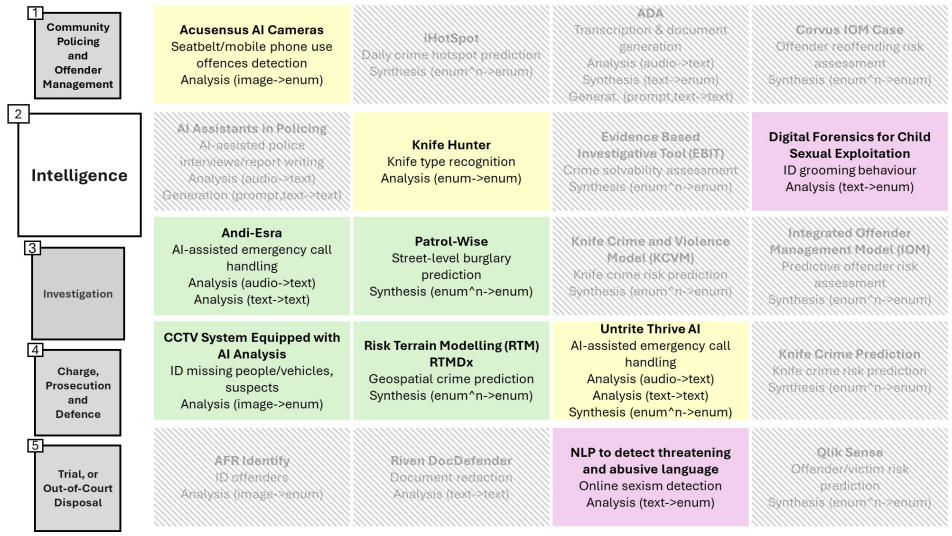

Figure 1: AI tools currently used in the *Intelligence* stage of the Criminal Justice (CJ) system in England and Wales. The purpose and taxonomy of each tool are stated below the name of each tool. The colour of each tool's box indicates the implementation stage of the tool: green for deployed, yellow for trialed, and pink for experimental. Shaded boxes indicate tools not used in the corresponding stages of CJ.

CCS Concepts

• **Computing methodologies** → **Artificial intelligence**; • **Social and professional topics** → *Governmental regulations*; • **Security and privacy** → *Privacy protections*; *Social aspects of security and privacy*; • **Applied computing** → *Law*.

Keywords

Probabilistic AI, Policing, Law Enforcement, Criminal Justice.

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1 Description & Impact Statement

Probabilistic AI systems, such as facial recognition, risk predictive tools, and large language models (LLMs) are introduced in policing and the wider criminal justice (CJ) and law enforcement system in many countries worldwide, including the UK. There are a variety of implementations, commercial and in-house, and applications and variations across countries. These tools are also very often introduced, implemented, trialed, and deployed on a force-by-force basis [3].

Mapping the probabilistic AI ecosystem in CJ in a systematic and coherent way could help us better understand the extent of AI's usage (how, when, and by whom) and thus their impact on people's lives, compare tools, and identify caveats (bias [3, 6], obscured or misinterpreted probabilistic outputs [2, 4], cumulative effects by AI systems feeding each other [1], and breaches in the protection of sensitive data), as well as opportunities for future implementations. Such a mapping would help us to identify implications for other organizations in the CJ system and enable organizations consider how AI outputs may feed into evidential contexts. It could also help to identify what is required to build a tested and trusted framework to steer the development and deployment of AI tools in CJ so they are responsible, effective, and trusted by the communities and they respect their rights.

We have developed a systematic way to characterise probabilistic AI tools across the CJ stages with the aim of providing a coherent presentation of the AI-tools-in-CJ landscape. We use the paradigm of the England and Wales CJ system and have examples of real AI tools currently in use. For example, Fig. 1 presents examples of tools mapped in the "Intelligence" stage of the CJ system. Both legal and technical perspectives are considered to create this map. This research is ongoing and we are engaging with UK Police organisations and government. We have spoken to over 6 police forces and policing, government and legal bodies, and our mapping includes more than 50 AI tools used, trialed or experimented with. Although this mapping is reflective of AI tools in use in the England and Wales' CJ system, it is nonetheless easily adaptable to ecosystems in other countries as the methodological underpinnings are applicable irrespective of jurisdictional peculiarities.

We propose an engagement workshop to present our systematic mapping of probabilistic AI in CJ. This will be beneficial for potential stakeholders, e.g., police officers, lawyers, judges, commercial system developers, and public sector bodies as they will better understand where and how AI is used in CJ and learn about a holistic approach to exploring its application in CJ. This will also be interesting for the general public as it will provide a deeper understanding of the extent to which the AI tools used in CJ do and will affect our lives.

We aim here to bring together researchers in CJ, Computer Science, and AI more broadly to discuss the significance, effectiveness, and impact of such a map. How, when, and by whom would this be used? How could it help law enforcement stakeholders increase their transparency to the public about their use of AI tools? How could we further improve our mapping to the benefit of the potential stakeholders? How could academic research and interdisciplinary work contribute to this? How could we use this map to scope for future developments of probabilistic AI in CJ? No prior knowledge is required to attend and contribute to these discussions.

2 Team

This workshop will be organized and presented by members of the PROBabLE Futures (Probabilistic AI Systems in Law Enforcement Futures) project [5]. This is a four year, £3.4M RAi-funded, interdisciplinary research project led by Northumbria Law School's Professor Marion Oswald MBE, in collaboration with a team of multi-disciplinary co-investigators from Northumbria, Glasgow, Northampton, Leicester, Cambridge, and Aberdeen Universities.

3 Timeline

- **The CJ Landscape in England and Wales.** *(10')*
  The stages of the CJ system and the way police forces are organized in England and Wales will be explained.
- **Taxonomy of the AI Tools Used in England and Wales CJ System.** *(10')*
  A characterisation of AI tools used for policing applications (e.g. facial recognition, offender risk assessment, emergency call handling, online hate-speech detection) within in the CJ system in England and Wales will be presented. A key component of the characterisation is a taxonomy that is based on the mode of inference and mode of inputs/outputs.
- **Examples of Mapping the AI tools in CJ.** *(20')*
  Concrete examples of AI tools used in the CJ system in England and Wales will be presented along with their mapping in the CJ stages.
- **Q&A.** *(20')*
  The session will close with a Q&A, where the attendees will have the opportunity to discuss with us the UK experience and how it compares to other countries, their experiences/knowledge/thoughts around the topic, the impact this map could have, and to make suggestions of how we could further improve the systematic study of these systems to the benefit of the involved stakeholders and the public, and to suggest how we could use this map to scope for the future.

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