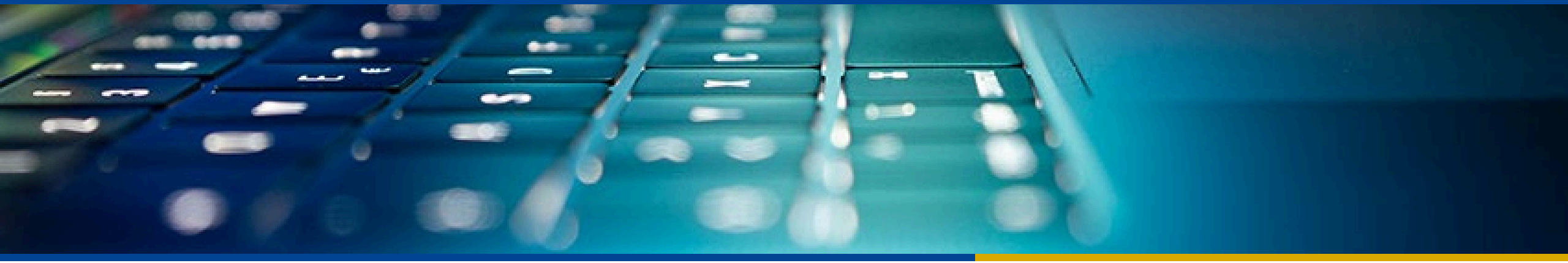
eu-LISA Working Group on Artificial Intelligence

Workshop – prioritisation of AI use-cases



Short stay visa issuance

Use case ID	Brief description (see Annex B |for a detailed description)
VISA-1 (Application chatbot)	Chatbot supporting visa application process by (1) taking in information, (2) answer questions posed by the applicant and (3) ensure data quality.
VISA-3 (Application triaging)	Application triaging using individual risk assessment for rapid, more efficient risk analysis.
VISA-8 (Identification of irregular travelling patterns)	Identification of irregular travelling patterns as an additional piece of risk analysis and identify so-called "malafide" travellers.
VISA-9 (Tailored application form)	Use of a personalised application form using AI to tailor questions asked to the applicant creating an augmented application form.

Identification of irregular travelling patterns – use case description

Problem statement
To avoid suspicion, some travellers take convoluted routes to avoid attention from authorities (e.g. going from Egypt to Belgium through Japan). Due to the complexity, these routes are not always identifiable by the authorities. This can lead to TCNs entering the Schengen Zone without having undergone appropriate assessment regarding risks such as overstaying.
Description of the use case
AI base approach to monitor, search and combine data from different sources such as ETIAS and EES (but also PNR data collected by airlines) to detect possible “irregular travelling patterns. The AI could detect irregularity either at the 'node' level of a sequence of stops ("is it uncommon to travel from point A to point B?") or at the aggregate travel pattern level ("does the overall length and shape of this travel pattern appear to be different to usual behaviour?"). The outputs of this analysis could either prompt a human to investigate further, or feed into an “Engagement” based AI solution to ask the applicant for further information/documentation.
Benefits
Better insight into irregular travel patterns; Faster identification of possible high-risk individuals regardless of the country of departure; Systematic check for possible irregular travel patterns which can prompt further investigation.

Questions for discussion

- Do you agree that this particular use case should be prioritised?
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  - What are the main limiting factors/constraints?
  - Would you be willing to collaborate in a pilot with authorities from other MS? If no, why?
- Would EU funding be necessary to develop/pilot such a use case?
- Do you see an active role for eu-LISA in piloting such a use case? Other Agencies?
  - If yes, what role could eu-LISA play? Other Agencies?

Issuance of long-stay or residence permits in the Schengen Area

Use case ID	Brief description (see Annex B |for a detailed description)
LTSTAY-1 (Application chatbot)	Virtual assistant supporting long-term stay permit or migration application process
LTSTAY-3 (Application triaging)	Automatic triaging of applications to speed up risk assessments
LTSTAY-9 (Moving within the Schengen area)	Supporting system for moving within the Schengen Zone, speeding up the application process (e.g. through use of a virtual assistant)

Automatic triaging of applications – use case description

Problem statement
Requests for long-term stay or residence are high and rising in volume and variety, and it is a complex task to appropriately assess categories of cases as it requires certain "local knowledge" (e.g. documents evidencing family links or professional qualifications from India compared to Egypt). Furthermore, governments are struggling to keep up with the number of requests and timely response regarding the enquiry.
Description of the use case
An AI triaging system could be implemented to automatically and rapidly identify standard applications and classifying more complex applications for human review. Classifying means grouping similar applications (e.g. from a certain country or reason for travel) for review by an expert experienced at dealing with a certain type of application. By grouping the applicants, the responsible officers would take save time in the ‘basic’ ones, and would only spend more time, in those that are classified as complex.
Benefits
Increase in the efficiency and accuracy of the process; improve the user experience for applicants; decrease the dependency on a human assessor to classify applications.

Questions for discussion

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Asylum

Use case ID	Brief description (see Annex B |for a detailed description)
ASYLUM-3 (Vulnerability assessment)	Sensory analysis of individual to analyse if the person should be further investigated by a human social worker or granted special procedural guarantees
ASYLUM-5 (Registration chatbot)	Use of an AI chatbot which facilitates the registering process by going through the steps which do not require human expertise
ASYLUM-7 (Abscondment risk assessment)	AI model to predict risk of an applicant absconding during review of application and the return process (e.g. using variables such as country of origin, previous application history, age)
ASYLUM-11 (Refugee allocation	AI to allocate refugees to geographic regions (at regional level within countries) where they are more likely to find work and integrate smoothly
ASYLUM-14 (Intelligence search engine)	Intelligent search engine to assist with risk assessment of returns to origin country by locating documents, reports, other evidence

Vulnerability assessment – use case description

Problem statement
The first step when the authorities come in contact with undocumented migrants at border crossings is to perform a 'vulnerability check'. This is to judge whether a person is in immediate danger or has special needs, and this requires expertise and experience. There may be times where the individual does not want to provide the relevant information, for example if they are fearful. The process being quite subjective sometimes is a challenge in itself, but also the capacity of these experts (e.g. trained social workers or caseworkers) is a constraint on this sub-process which would be mitigated with efficiency improvements.
Description of the use case
AI to perform real-time analysis of an applicant's facial movements, spoken language and body language (plus any other potential aspects) to detect signals which can better inform decision-making by a human social worker/specialised expert (e.g. if the person should be granted special procedural guarantees). Techniques would seek to notice and assess the emotional cues implied by both what the applicant says/does and the way that they do it, either in terms of modelling apparent emotion types or by detecting fluctuating or unusual behaviour. This latter approach, where the solution would be used to detect deviations from a baseline, as opposed to directly detecting cues of vulnerability, is the more likely and feasible method for usage. the asylum context, applicants commonly experience negative emotions when recalling traumatic past experiences. An intelligent AI seeking to identify specific issues such as torture/trafficking (possibly by attempting to link emotional cues with corresponding usage/sequencing of specific words and phrases) would be a more advanced use case than one providing more general information (identified and quantified emotional signals) or more generic signs of distress or abnormal patterns in communication.
Benefits
• Reduced capacity pressures on the trained social workers/experts who are usually required to make these kind of assessments. • An additional method for ensuring vulnerable asylum seekers receive the appropriate procedural guarantees.

Questions for discussion

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External processes (MS): SIS/SIRENE

Use case ID	Brief description (see Annex B |for a detailed description)
SISSIRENE-1 (Alert detection)	Computer vision to detect SIS alerts using cameras
SISSIRENE-4 (Knowledge search/management tools)	An AI tool to aid in the knowledge management of SIS
SISSIRENE-6 (Automatic form completion)	Automatically fill in SIRENE forms

Automatic form completion – use case description

Problem statement
Filling in SIRENE forms requires to be done in a consistent and correct way, to ensure that the communication between Member States happens smoothly. The officer needs to choose which form to use and then fill it with the correct information. However, in practice it is observed that not only the officers use the wrong forms, but also that these are not filled in accurately and require a lot of human effort and further interaction to correct them.
Description of the use case
A SIRENE form can be completed using the information from the original alert alongside a report from an officer (highlighting the action taken). An AI system could be used to automatically recognise key information from the alert, and to collect and structure information coming from an officer's report. Specifically, using natural language processing (NLP), the system would work as a virtual assistant to interact with the officer and gather the necessary information to automatically complete the SIRENE form determined to be correct. Then, this information would be sent to the other Member State (perhaps with automatic translation to the correct new language). The technical approach would use techniques like entity recognition and 'spellcheck'-type functionalities as well as a chatbot interface, as described in VISA-1 and VISA-9.
Benefits
Ensure the use of the right form for a specific alert; Grant correct filling of the forms, improving the communication between Member States; Reduce the number of interactions needed between Member States.

Questions for discussion

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Generic: transversal processes

	Use case ID	Brief description (see Annex B |for a detailed description)
	CROSS-1 (Multi-lingual translation)	Multi-lingual translation
1	**CROSS-6 (Forged supporting docs detection)**	Identification of fraudulent supporting documents
	CROSS-7 (Historical case reasoning)	Consistent decision making (historic case reasoning engine)
	CROSS-8 (Ethical monitoring)	AI to monitor the ethicality of other AI systems
2	**CROSS-12 (Forged travel document detection)**	Detection of forged travel documents
	CROSS-20 (Post application monitoring)	Post application monitoring of TCNs
	CROSS-23 (General EU chatbot)	Effective and simplified stakeholder communication
	CROSS-25 (Biometric matching)	Improved biometric matching (facial recognition)

Identification of fraudulent supporting documents – use case description

Problem statement
The process to detect fraudulent documents during a risk assessment is performed manually by a case worker, requiring significant expertise and experience. However, the manual process is subject to human error and can be very time-consuming (especially if reliant upon very specific local knowledge of certain documentation types).
Description of the use case
AI to detect forged supporting documents such as birth certificates or bank statements (note: this use case excludes travel passports). The model would attempt to identify documents, which appear fraudulent in various ways: for e.g. if the layout/format of a document is not of the expected type, if the contents of the document are not internally consistent, if the contents of the document are not consistent with other information provided. Examples of these types could be misplaced logos and sections (with respect to known examples), mismatched data in different locations (such as two different spellings), mismatched data in different documents (such as mentioning a different education background in a CV vs. in an education qualification document). To analyse documents in this way, text-based models and image-based models could be used together. The model would seek to flag potential cases for human review, for example by highlighting which areas of documents should be investigated further. Advanced approaches here could include investigating the activations in a Generative Adversarial Networks (focused on the discriminator component) to see which pixels of an input image look the 'most fake' (i.e. contributed most significantly to the classification as fake)
Benefits
• Improved identification of fraudulent documents irrespective of expertise or experience by means of ensuring minimum quality level performed by an AI engine; • Faster identification of fraudulent documents freeing up time for more value-added tasks by case workers.

Questions for discussion

- Do you agree that this particular use case should be prioritised?
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Detection of forged travel documents – use case description

Problem statement
Border guards are trained to identify stolen or forged documents The references of stolen travel documents are reported in databases like SIS operated within the EU and SLTD (Stolen and Lost Travel Documents) operated by Interpol. However identifying forged documents requires expertise and experience, as the border guards must know the documents from all around the world and be able to distinguish a forged/falsified document from an original. Moreover, humans are subject to error and therefore it is possible that a traveller is able to pass the border with a forged/falsified travel document. This is even more problematic when considering the potential inconsistency in decisions made by different officers. Specifically, this could result in a situation where two forged documents are treated differently for the same procedure (request for a permit, border crossing) and where one officer sees that the documents are forged and the other one does not.
Description of the use case
By using computer vision, an AI system can detect the use of forged travel documents. To do so, it would analyse the captured image of the provided documents and assess if the physical characteristics of the document matches an original one, if the information provided in the documents is accurate, and the person providing the documents corresponds to the person in the document and is not a lookalike. The technical approach would be similar to CROSS-6 which is focused on supporting documents.
Benefits
Increase the security in the Schengen Area; Reduce the dependency on the officers' expertise and experience; increase the consistency of decision making.

Questions for discussion

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Other use-cases suggested by the respondents

- Transcription (speech to text)
- Categorization of criminal data for further analysis
- Pattern identification in visa application supporting documents (including pattern identification based on document numbers and issuing authority)
- Identification of travel documents produced using stolen blanks
- Forensic analysis of graphic/video evidence (e.g., child sexual abuse) using AI tools

Questions for discussion

- In addition to the use cases mentioned above would you like to suggest any other use cases?
- Would you prioritise the development of the use cases suggested above in addition to the ones discussed in the study?
- What are the main reasons to prioritise this particular use case?
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Thank you !

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