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AI systems for emotion recognition in the areas of workplace or education institutions

Summary of responses and next steps

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Summary and next steps

This document provides a summary of responses and identifies follow-up steps in relation to the previous call for input regarding the sixth prohibition in Article 5 of the AI Act (see document DCA-2024-02). This concerns AI systems for emotion recognition in the areas of workplace or education institutions.

Overall, the AP distils three main observations from the responses received.

Main observation 1 – Respondents describe how developments in modern AI technologies seem to be taking off and how this leads to attempts to recognise emotions and intentions.

New AI technology enables increasingly complex applications that attempt to recognise emotions. Today, developments go way beyond sentiment analysis based, for example, on text, as advanced AI technologies are also used to analyse facial expressions. Moreover, 'emotion recognition' is often part of a multi-functional AI system. In addition, multimodal capabilities of AI systems offer the possibility to obtain information about a person's emotions or intentions from different types of data. At the same time, there are concerns about the reliability of these technologies, and their use entails risks that may lead, for example, to discriminatory effects. The use of the technology may also be intrusive and result in privacy risks. It is therefore advisable to be careful with the use of these technologies, even in situations that do not relate to the workplace or education institutions.

Main observation 2 – Many respondents point out the need for further clarification of the elements in the prohibition that are relevant to the scope and therefore the practical importance of the prohibition.

The prohibition regarding emotion recognition contains legal connections and concepts that – in the AI Act itself – are only operationalised to a limited extent. The contributions of respondents show that there is a need for clarification on a number of subjects from the prohibition. For example, the distinction between emotions and physical states and between emotions and easily visible expressions is unclear. The difference between emotions and intentions also raises questions; the meaning of intentions remains unclear. These concepts determine the scope of the prohibition, and their implementation in practice has an effect on which forms of analysis and evaluation of behaviour, characteristics and perceptions of people are prohibited and

which are not. The recently published Guidelines of the European Commission on the prohibitions provide guidance, but offer somewhat limited clarity on the applicability of the prohibitions in specific practical cases.

Main observation 3 – Respondents note that there is a lack of clarity about the concept of 'biometric data' in the AI Act and how it should be read in conjunction with the GDPR.

Respondents remark that the definition of the concept of 'biometric data' in the AI Act appears to be different from that in the GDPR. What exactly this means for the interpretation of the term 'biometric data' in the AI Act raises questions among respondents. In the GDPR, the definition of 'biometric data' is linked to the unique identification of a natural person that is allowed or confirmed by the processing of personal data. The AP notes that the definition of the term 'biometric data' in the AI Act must be interpreted in the light of the GDPR. The AP further emphasises that the AI Act complements the GDPR and other laws and regulations. If emotion recognition takes place on the basis of personal data, the requirements set out in data protection law must also be met.

The AP uses information and insights gathered from the call for input to support the preparation of Dutch supervisory authorities for supervision of the prohibitions and will further incorporate the input received in education about and explanation of the prohibitions in the coming months. Cooperation and coordination with other supervisors take place in, inter alia, the AI and Algorithm Chamber of the Dutch Cooperation Platform of Digital Supervisory Authorities (SDT). In addition, the input provides a basis for the AP's contribution to the discussion on the further explanation of the prohibitions, including the European Commission's Guidelines.

I. Background

AI Act & prohibited AI

1. **The AI Act (2024/1689) entered into force on 1 August 2024.** This act sets out rules on the development and use of artificial intelligence (AI) in the EU. The starting point of the AI Act is that there are many useful applications of AI, but that the technology also entails risks that need to be managed. Some AI systems with unacceptable risks will be prohibited.

Call for input

2. **On 31 October 2024, the AP issued a call for input regarding the sixth prohibition in Article 5 of the AI Act.** This concerns AI systems for emotion recognition in the areas of workplace or education institutions (hereinafter: prohibition F).

3. **The call for input aims to gather information and insights from stakeholders (citizens, governments, companies and other organisations) and organisations representing them.** The AP aims to collect information that will serve as a basis for preparing a further interpretation of the prohibitions in the AI Act. The call for input is also part of a series of calls with regard to the various prohibitions in the AI Act. More information about the AI Act, the prohibitions and the role of the AP as a supervisory authority can be found on the website of the AP and in the previously published call for input.

4. **Between 31 October and 17 December 2024, the AP received input from twenty-four respondents, including various organisations and individuals with diverse backgrounds, such as, for example, academics.** The AP is pleased that the call has reached citizens, companies, researchers and civil society organisations and that they have wanted to contribute by submitting input.

5. **On the bases of the input received, this summary document was prepared.** All input has been reviewed by the AP and the main points have been included in this document. The document refers only in generic terms to the submitters of the input received. In a number of places in this document, the input is also appreciated by the AP. This has been done where appropriate and where it could be traced back directly to the provisions of the AI Act or where an (additional) point of view could be provided. In doing so, the AP aims to contribute to the discussion on the interpretation of the prohibitions. On 4 February 2025, the European Commission published the adopted 'Guidelines on prohibited artificial intelligence practices established by the AI Act' (hereinafter: Guidelines).[1] Where possible and relevant, the AP answered respondents' questions in this document using the guidelines. With this document, the AP does not intend to provide an explanation of the prohibitions or related laws.

AI Act compliance supervision

6. **The AP made this call for input in its role as coordinating supervisor on algorithms and AI.** Within the AP, these tasks have been assigned to the Department for the Coordination of Algorithmic Oversight (DCA). The call for input is an extension of the preparatory work being done for the supervision of prohibited AI systems under the AI Act. The government is currently working on the formal designation of national supervisors for the AI Act. The AP (from the Department for the Coordination of Algorithmic Oversight) and the Dutch Authority for Digital Infrastructure (RDI) have issued an advice on this matter in cooperation and coordination with other supervisory authorities. It has been recommended, among other

[1] European Commission 'Guidelines on Prohibited Artificial Intelligence practices established by Regulation (EU) 2024/1689 (AI Act)'. (2025)

things, that the AP be designated as the market surveillance authority for most of the prohibitions in Article 5.

II. Summary and evaluation of input submitted

General points

Concerns about emotion recognition

7. **A collective of Dutch civil society organisations and institutes, but also a foreign civil society organisation, point out the risks of using emotion recognition both within and outside the sphere of education institutions and the workplace.** These organisations, for example, emphasise the risk of bias and advocate a broad prohibition. The recitals of the AI Act account for those risks by pointing out the flawed scientific basis of such AI systems and the fact that emotions vary widely between cultures and situations. The European Data Protection Authorities themselves also expressed their concerns in 2021.[2] However, the prohibition in the AI Act has not been broadened; it only applies 'in the areas of workplace and education institutions'. The AI Act allows for applications in other contexts, provided that the high-risk rules in the AI Act and other relevant laws and regulations, such as the GDPR, are complied with.

8. **The development and deployment of AI systems that aim to recognise emotions or physical states seems to be taking off, according to respondents' input.** A respondent describes an application in which a 'social' robot serves as a friend/carer for elderly people to improve care. Another respondent describes AI systems with a form of emotion recognition that can be used to prevent 'overtraining' in professional fitness and can ensure that athletes are not pushed too far and their well-being can be monitored. Yet another respondent describes how, in the automotive industry, monitoring systems are developed to detect a driver yawning, blinking, or swinging the car, to detect drowsiness or distraction. By way of illustration, a vehicle equipped with cameras may interpret frequent nodding of the head as a sign of fatigue, triggering a safety warning or autonomous steering to prevent accidents.

Specific points

Criterion 1: Inference and identification of emotions and intentions

Several respondents indicate that there are different AI applications for inferring and identifying emotions and intentions. Respondents cite as inputs for such AI systems: facial images, speech recognition, motion detection, physiological measurements (based on heart rhythm, muscle tone and body heat). According to respondents, AI systems are used in different contexts in an attempt to identify or infer people's inner feelings, moods and intentions. Respondents also point out that functions for the inference and identification of emotions are integrated into multi-purpose AI systems. For example, an AI system primarily intended for transcribing meetings can also infer emotions or intentions to enable an additional functionality.

9. **Respondents have insight into different applications of AI systems and direct attention to the possibilities to integrate forms of emotion recognition into the broader functionality of an AI system.** AI applications can contain various features; the same goes for AI systems that can infer emotions or intentions. A respondent notes that inferring emotions or intentions is often not the *primary* goal of an AI system. For example, AI systems can be used to assess applicants, transcribe meetings or monitor students during a test, but at the same time also identify emotions. According to respondents, the question is whether the entire AI system is therefore prohibited or only the feature for inferring emotions. It appears to the AP that

[2] EDPB/EDPS Joint Opinion 5/2021 'on the proposal for a regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence', paragraph 35.

recognising emotions does not have to be the primary goal for the applicability of the prohibition. The Guidelines do not elaborate on this issue.

10. **Several respondents note that it is not clear from the prohibition when there is a prohibited form of inferring or identifying emotions.** Respondents also point out the possibility of an AI system noticing an expression (such as crying) without linking it to an emotion (sad). Moreover, respondents indicate that the difference between inference and identification is not clear. Respondents specify that, in fact, emotion recognition is often a percentage of the possible presence of a particular emotion. According to the AP, this is emotion recognition within the meaning of the AI Act. A different conclusion would deprive the prohibition of all relevance. The Guidelines explain that the identification of emotions happens when the processing of biometric data allows a direct comparison with an emotion.[3]

Criterion 2: Emotions and intentions

Respondents indicate that there is uncertainty about the concepts of 'emotions' and 'intentions'. Many respondents stress the importance of an unambiguous interpretation of these concepts. Respondents also note that the distinction between emotions and intentions relative to 'physical states' and 'readily apparent expressions' is unclear. According to a number of respondents, there is a need for practical examples to make the application of the prohibition workable.

11. **In the context of legal certainty, several respondents note that there is a need for an unambiguous explanation of both 'emotions' and 'intentions'.** The recitals of the AI Act give examples of emotions and intentions such as happiness, sadness, anger, surprise, disgust, embarrassment, excitement, shame, contempt, satisfaction and amusement. Respondents cite other examples such as anxiety, nervousness, stress, interest, frustration, impatience, aggression and irritation. In addition, respondents note that 'emotion' is a concept that is hard to define, particularly because it is highly context-dependent. One respondent emphasises that providers of AI systems also claim that their systems are able to recognise more complex emotional states, such as nervous happiness or frustrated boredom. One of the respondents defines intentions as finding the reasons behind observable behaviour. Another respondent indicates that the term intentions (from the recitals in the AI Act), used without introduction, examples and further explanation, causes confusion. One of the respondents notes that intentions are not mentioned in the prohibition's text and that deriving or determining intentions therefore falls outside the scope of the prohibition. The AP stresses that intentions are mentioned both in the definition of 'emotion recognition system' and in recital 18 of the AI Act, which clarifies this prohibition. The Guidelines show that the concept of emotions must be interpreted broadly and that intentions are also covered by the prohibition. It is added that the prohibition cannot be circumvented by working with or referring to *attitudes* of people in a system.[4] Therefore, establishing an 'angry attitude' is likewise covered by the prohibition.

12. **Many respondents mention that a clear distinction should be made between 'emotions' on the one hand and 'physical states' on the other hand.** Respondents indicate that interpretations such as stress, pain and fatigue can be both an emotion and a physical state. For example, stress can be measured by physiological signals (heart rate, body temperature) which in turn can be the basis for an interpretation of a person's emotion. In this way, measuring physical parameters can be used to derive emotions and intentions. A respondent mentions as an example of a physical condition the fatigue that is reduced, for example, by temporary workers in high-risk occupations to prevent accidents. To clarify the difference, another respondent suggests that a physical state indicates an objective perception, while an emotion or intention

[3] Guidelines, paragraph 246.
[4] Guidelines, paragraph 247.

refers to an inference from or an interpretation of an objective perception. It appears that respondents need a clear distinction between these concepts. The Guidelines clarify that the observation that a person is laughing is not a form of inference or identification of emotions. The conclusion that someone is happy is a form of emotion recognition.[5]

13. **According to several respondents, the difference between 'readily apparent expressions' on the one hand and 'emotions' and 'intentions' on the other hand is not clear.** It follows from the recitals to the AI Act that inference of readily apparent expressions is not prohibited. If readily apparent expressions are used to identify or infer emotions or intentions, this practice does fall within the scope of the prohibition. Many respondents note that the difference between emotions (and intentions) on the one hand and easily visible expressions on the other hand is difficult to interpret. One respondent states that basically any read emotion is a readily apparent expression, since it is not possible to really 'read' what people feel (inner emotion). It is clear from the Guidelines that the characteristics of one's voice, such as raising one's voice or whispering, are examples of a readily apparent expression that is not covered by the prohibition.[6]

Criterion 3: Based on biometric data

In the context of prohibition F, respondents note that the definition of biometric data in the AI Act differs from the definition in the GDPR. One respondent also notes that the wording of an AI emotion recognition system in the prohibition differs from the wording in the definition in Article 3, which results in confusion about the use of biometric data as an element of the prohibition.

14. **According to several respondents, it is unclear how the coherence of the concept of 'biometric data' between the AI Act and the GDPR should be read.** One respondent indicates that the definition of biometric data differs in that the GDPR allows or requires the confirmation of 'unique identification' of natural persons. The respondent makes it clear that, for example, physiological data and behavioural characteristics that cannot lead to unique identification do fall within the definition of the AI Act. It is vague to several respondents how the understanding of biometric data in the AI Act should be interpreted and what its practical implications are. The AP notes that the definition of 'biometric data' should be interpreted in the light of the GDPR.

15. **Other respondents note that the concept of 'biometric data' is broadly defined in the AI Act, citing several examples.** Examples of biometric data that are mentioned include physiological data such as heart rate, skin conduction, breathing patterns and eye movements. Other examples are facial images, voice characteristics or patterns, but also the analysis of walking movements and eye movements.

16. **Respondents note that it is unclear whether neural data and behavioural characteristics are covered by the understanding of physical, physiological and behavioural characteristics in the AI Act.** Another question is whether the prohibition also applies to multimodal systems where both biometric and other data are analysed. A related question from a respondent is whether systems that use both facial and emotion recognition are prohibited in their entirety or only the functionality that allows emotion recognition at the time such systems are deployed in the context of the workplace or education institutions. The Guidelines underline that the term 'biometric data' should be interpreted broadly. Similarly, modalities of a microscopic nature, such as DNA and odour, are also covered by the definition. In addition, behavioural and movement biometrics, such as signatures, walking, keystrokes and electrocardiograms (ECG), also fall

[5] Guidelines, paragraph 249.
[6] Ibid.

under biometric data. It appears that biometric input, in this context, can relate to either one or more modalities.[7]

17. **Finally, several respondents mention that the prohibition does not refer to biometric data as defined in Article 3(34) of the AI Act, as is the case for high-risk AI applications for emotion recognition (Annex III).** Respondents point out that it is therefore unclear whether the prohibition requires the use of biometric data for it to apply. The concept of 'biometric data' is included in the definition of 'emotion recognition system', but the prohibition does not use the latter concept and instead refers to a system that infers emotions. It appears to the AP that the AI Act contains an inconsistency in this regard and that the intention was precisely to create a consistent regime for prohibitions on the one hand and high-risk AI systems for the recognition of emotion on the other hand. This also follows from the Guidelines, in which the definition of emotion recognition systems in Article 3(39) of the AI Act is also considered relevant for the prohibition. The prohibition therefore covers forms of emotion recognition based on biometric data within the meaning of the AI Act. Sentiment analysis based on text, which is not based on biometric data, as proposed by a respondent, is therefore not covered by the prohibition.[8]

Criterion 4: The workplace or education

Respondents mention that the concepts of 'workplace' and 'education institutions' can be interpreted both narrowly and broadly. Many respondents are familiar with various applications of inferring emotions and intentions in the areas of workplace and education institutions. Respondents also provide examples of situations or applications for which it is not clear in advance whether they would be covered by the prohibition.

18. **The majority of respondents call for a further clarification of the scope of the concept of 'the workplace'.** Respondents indicate that emotion recognition in the workplace can be used to improve customer service and comfort and to monitor engagement, working behaviour and job satisfaction, both in online meetings and in the office. Many respondents stress that there is insufficient clarity on how 'situations related to the workplace' are addressed. One respondent argues that it is unclear whether AI systems that do not infer emotions from employees, but are set up in workplaces, are also covered by the prohibition. According to the respondent, there are AI systems that identify emotions from customers during customer service conversations, where the inference of emotions is not aimed at the employee, but at the customer. The Guidelines clarify that emotion recognition applications in call centres aiming at identification of customer emotions are not prohibited.[9] Respondents do not have a clear idea of the application of the prohibition in the case of hybrid or remote working. Environments such as a prison and healthcare institutions, which serve both as a private and as a working environment, also constitute a grey area, according to a respondent. The Guidelines explain that the workplace includes any specific physical or virtual place where natural persons engage in tasks and exercise responsibilities assigned by their employer or the organisation to which they are affiliated. The status of the natural person does not matter, and may be, for example, that of an employee, self-employed person, contractor, trainee or volunteer.[10]

19. **Respondents react differently to the applicability of the prohibition in the context of recruitment and selection.** One respondent argues that recruitment and selection related to the workplace are not covered by the prohibition. The respondent explains that this practice is not supported by either the text of the prohibition or the recitals. In addition, the respondent highlights that the use of AI systems for

[7] Guidelines, paragraph 250-251.
[8] Guidelines, paragraph 251.
[9] Guidelines, paragraph 254.
[10] Ibid.

recruitment and selection of candidates is one of the high-risk applications listed in Annex III of the AI Act, and therefore emotion recognition in the context of recruitment and selection cannot be prohibited. Another respondent notes that a difference should be made here between employees who are monitored in the context of their job versus other contexts, such as a job interview. This respondent therefore assumes that the prohibition applies only in the first context. The Guidelines explain that unequal power relations may already play a role in the recruitment stage and that the inference and identification of emotions or intentions during the process of recruitment and selection and are also covered by the prohibition.[11]

20. **The majority of respondents indicate that it is often unclear when an AI system is applied in 'education institutions'.** Respondents mention various applications of emotion recognition in education, such as monitoring student engagement, focus and satisfaction, supporting interactive learning and an optimal learning environment, and improving communication between student and teacher.-Respondents mention various situations that are not sufficiently clarified, such as preparing teaching materials in the library, attendance of courses by teachers, but also, for example, online and distance learning. The concept of 'education institutions' is also broadly explained in the Guidelines. Education institutions here includes both public and private institutions, all types and ages, pupils and teachers, and any type of environment (online, hybrid, physical). According to the Guidelines, emotion recognition during the application/admission process at education institutions is also covered by the prohibition. [12]

[11] Ibid.
[12] Guidelines, paragraph 255.

Scope of the prohibition

Respondents state that there is a need for additional explanation of the situations falling outside the prohibition. When is emotion recognition allowed for medical or safety reasons? Several respondents also point out that the prohibition ignores other applications of emotion recognition with positive effects within the context of the workplace and education institutions.

21. **According to the majority of respondents, it is unclear when emotion recognition is used for medical or safety reasons.** Respondents indicate that it is unclear whether the inference of emotions for measuring mental well-being such as burn-outs or work stress by an employer, for example, counts as a medical reason. One respondent indicates that the example of therapeutic use also requires further explanation**.** Several respondents express doubts about whether the use of AI systems for inferring emotions to prevent aggressiveness and escalation (both in the workplace and in education institutions) counts as a safety reason. The Guidelines provide additional explanations on these restrictions of the scope of the prohibition.[13] Stress monitoring is not allowed in the workplace. Therapeutic use includes deployment of CE-marked medical devices.

22. **Several respondents wonder whether there is an exception for the use of emotion recognition systems for positive purposes.** One respondent notes that the prohibition ignores positive uses of identifying emotions in the areas of workplace and education institutions. In addition, one of the respondents mentions that emotion recognition without identification of a specific student cannot have consequences for that specific person, but can contribute to the improvement of teaching material or an interactive learning environment. Another respondent notes that emotion recognition can play a role in monitoring employee well-being and raises the question of whether the use of emotion recognition may be allowed or not. It appears to the AP that in such cases, emotion recognition is generally not used solely for 'medical reasons', but a variety of possible other motives also play a role, including possibly optimising the workplace, preventing sick leave, or improving the performance of employees. The Guidelines clarify that these restrictions on the applicability of the prohibitions should be interpreted strictly.

23. **Finally, respondents raise the question of whether requesting consent could be an exception to the prohibition.** For example, a respondent wonders whether the employer is allowed to use emotion recognition with the employee's consent. According to the AP, there is no basis for such an exception in the AI Act; therefore, consent cannot be an exception to the prohibition.

[13] Guidelines, paragraph 256 et seq.

III. Follow-up

24. **The publication of this summary document concludes the information-gathering process following the call for input on the prohibition of AI systems for emotion recognition in the areas of workplace and education institutions.** The input submitted leads to a number of key points, which are relevant to the interpretation that will be given to the prohibitions in the AI Act:

    a. **The various examples of respondents show that AI technology is developing rapidly and that applications such as trying to infer emotions and intentions seem to be taking off.** At the same time, there are concerns about the reliability of this technology and it is advisable to use it with caution, also in situations that do not relate to the workplace and education institutions.
    b. **The prohibition contains many terms and concepts that are not (or to a very limited extent) further explained in the AI Act.** The European Commission's Guidelines on Prohibitions provide guidance, but in practice offer limited explanation on the applicability of the prohibitions in specific cases. The clarification of certain terms and conditions in the prohibitions is crucial to ensure that they offer protection to citizens and legal certainty to economic operators.
    c. **This prohibition is closely linked to the concept of biometric data and regulations in this regard in, inter alia, the GDPR.** The AP notes that the concept of 'biometric data' in the AI Act should be interpreted in light of the GDPR.

25. **The AP is working on the preparation of the supervision of the prohibitions in the Netherlands and, in the coming months, will further use the input received as a basis for the preparation of information and explanation on the prohibitions**. The knowledge gained is shared with Dutch supervisory authorities in the Dutch Cooperation Platform of Digital Supervisory Authorities (SDT), and the AI and Algorithm Chamber (AAK) of the SDT will discuss which follow-up actions are needed to clarify the prohibitions in the AI Act. The above approach is in line with the vision of supervisory authorities to strive for a harmonised interpretation and application of rules that can be simultaneously applied to prohibited AI practices.

26. **The AP will also use practical insights collected as a basis for contributing to the discussion on the further development of the Guidelines on prohibitions.** The Guidelines should be seen as a 'living document' which, depending on (legal) developments, will have to be updated or adapted from time to time.