Proposals for regulating robots and AI in the EU

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2022

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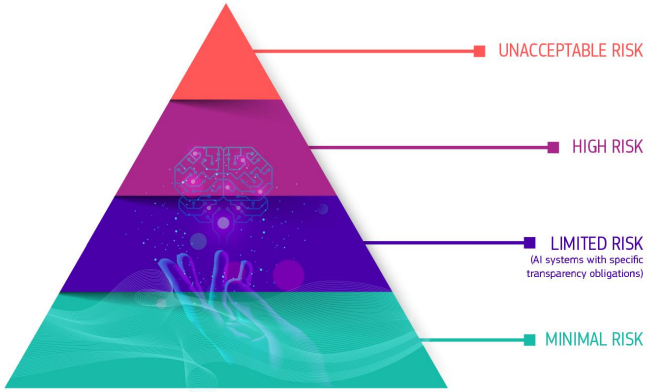


Ethics

- Human oversight
- Transparency
- Accountability

Data privacy

- Personal data
- Automated decision-making

Liability

- Product liability
- New liability rules

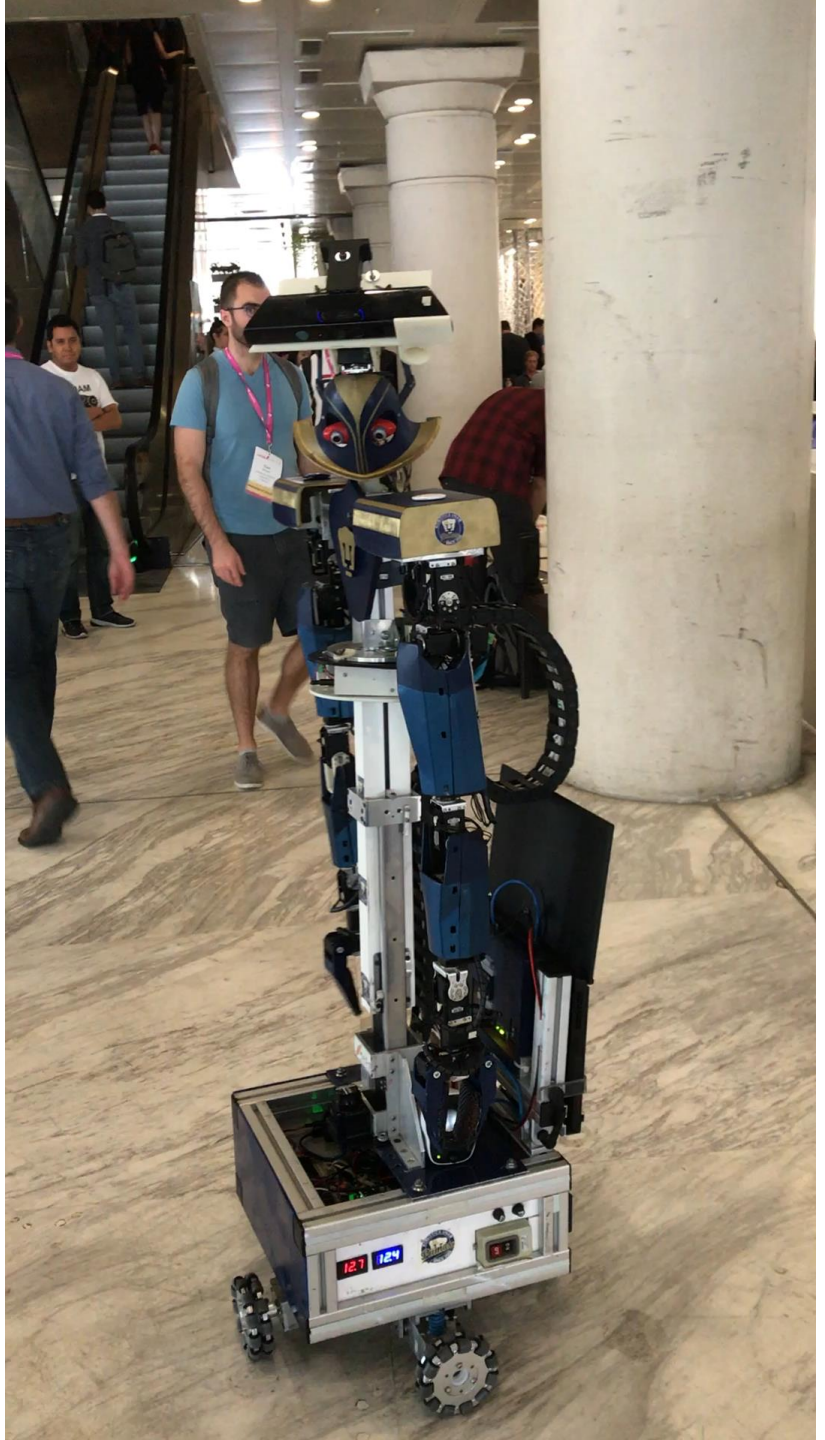
Product safety

- Machinery (robots)
- AI
- Toys
- Medical devices
- Tech standards

Evolving behaviour of robots

- Manufacturers must carry out risk assessment before the robot is placed on the market/ put into service.
- This must include also the risks appearing after the robot is placed on the market, due to its evolving and autonomous behaviour.

Summary of Proposed
EU Machinery Regulation



Risks in Human-Robot Interaction (HRI)

The prevention of risks of

- contact leading to hazard situations and
- the psychological stress that may be caused by the interaction with the machine shall be adapted to:

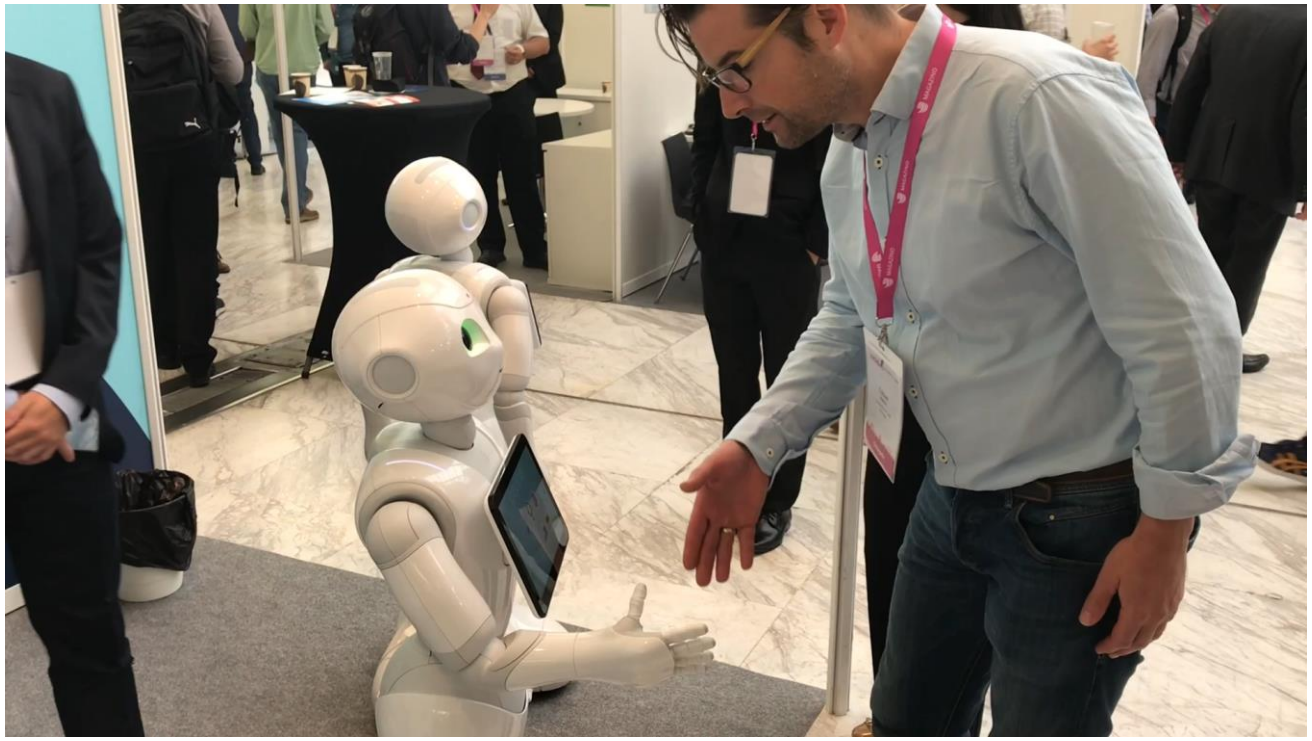
(a) human-machine coexistence in a shared space without direct collaboration;

(b) human-machine interaction.

(Machinery Regulation Proposal,
Essential Health and Safety
Requirements, § 1.3.7)

Communicating with the (polite) robot

The [robot]
- with fully or partially evolving behaviour or logic
- designed to operate with [partial] autonomy
- shall be adapted to respond to people adequately and appropriately
- (verbally through words or nonverbally through gestures, facial expressions or body movement)
- and to communicate its planned actions (what it is going to do and why) to operators in a comprehensible manner.



(Machinery Regulation Proposal, Essential Health and Safety Requirements, § 1.3.7)

Artificial Intelligence Approaches

(a) **Machine learning approaches**, including supervised, unsupervised and reinforcement learning, using a wide variety of methods including deep learning;

(b) **Logic- and knowledge-based approaches**, including knowledge representation, inductive (logic) programming, knowledge bases, inference and deductive engines, (symbolic) reasoning and expert systems;

(c) **Statistical approaches**, Bayesian estimation, search and optimization methods

EU Commission:

- ‘artificial intelligence system’ (AI system) means software
- that is developed with one or more of the techniques and approaches [previous slide]
- can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions
- influencing the environments they interact

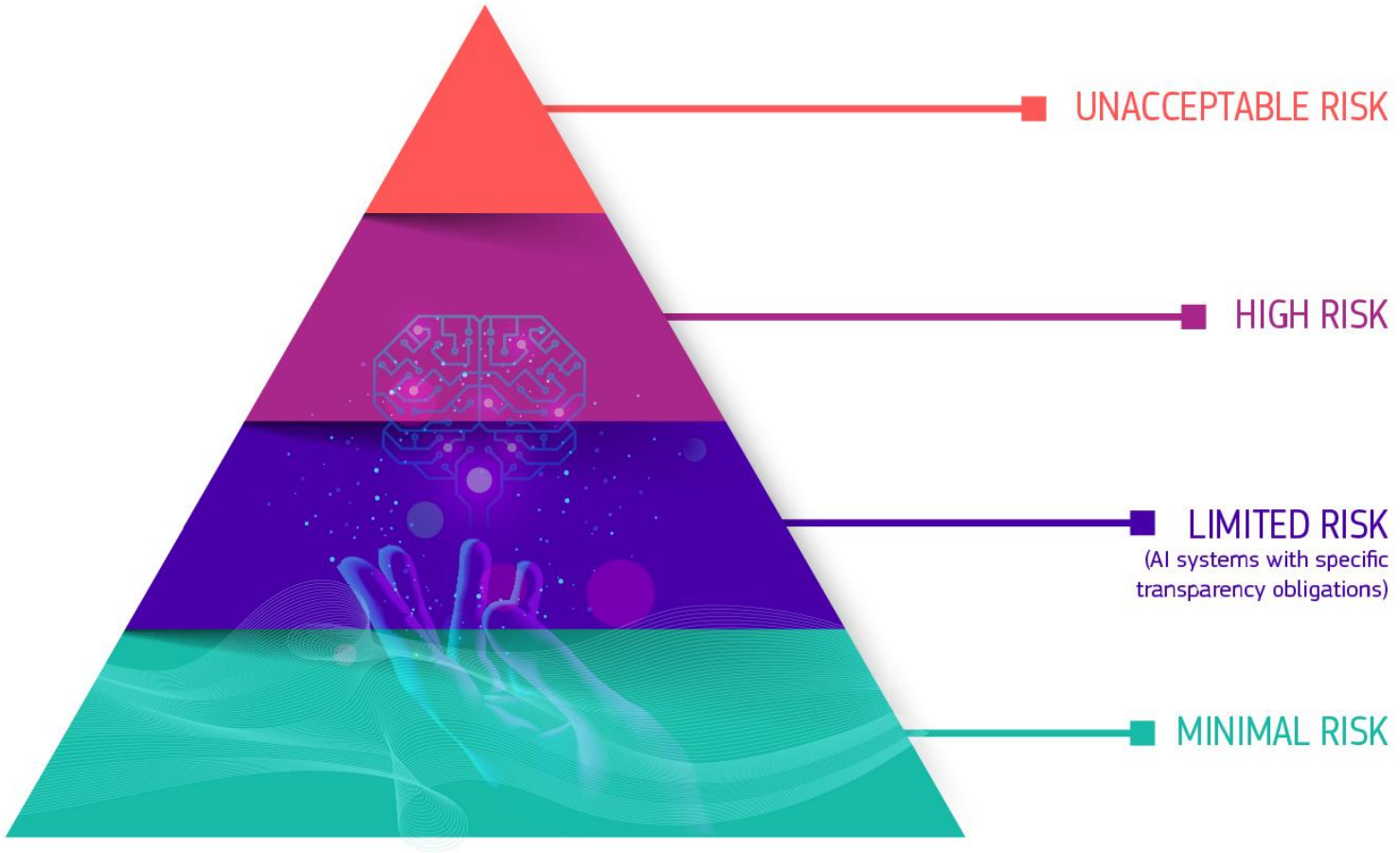
with;

Lift logic?

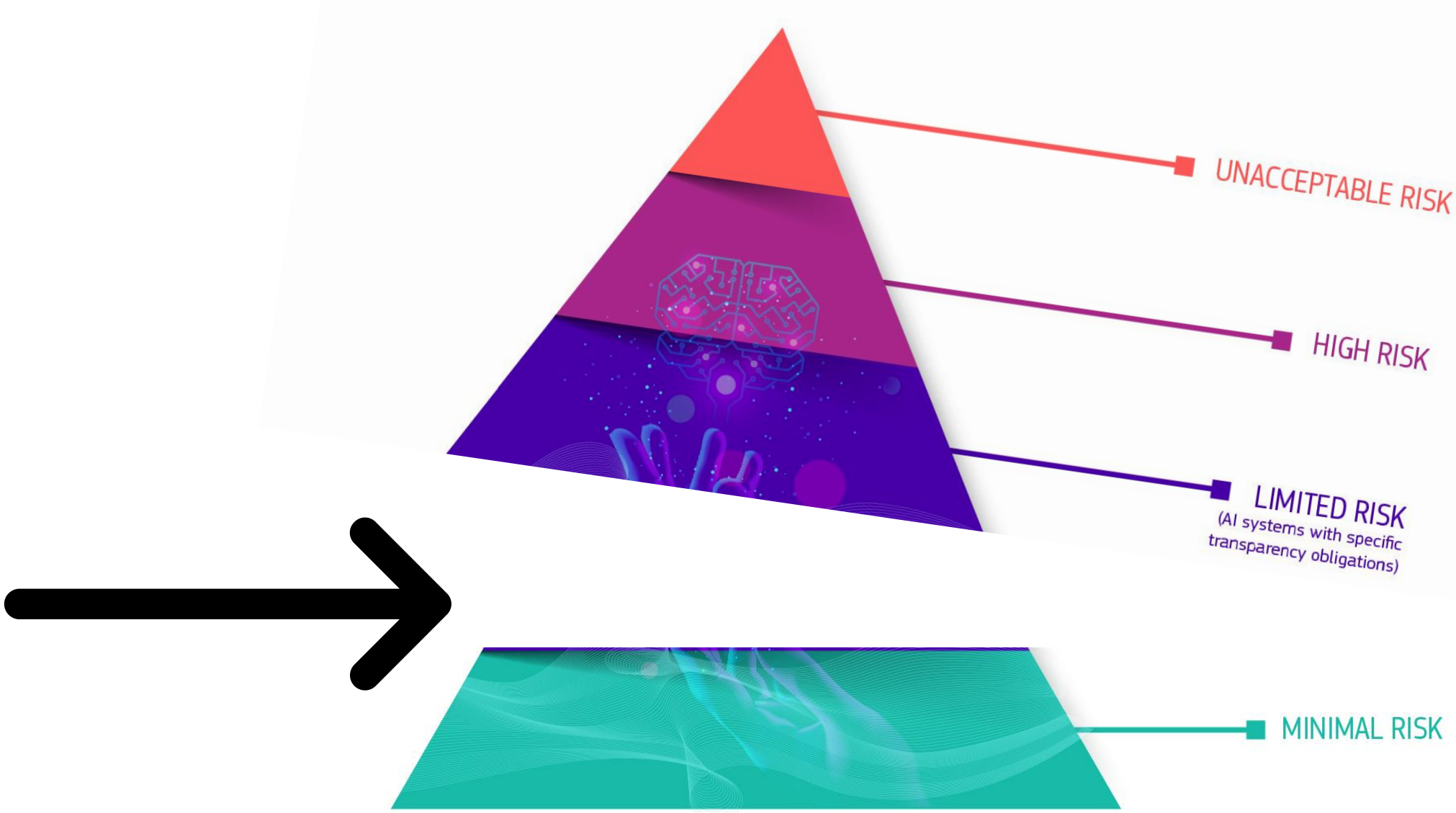
EU Council: ‘artificial intelligence system’ (AI system) means a system that

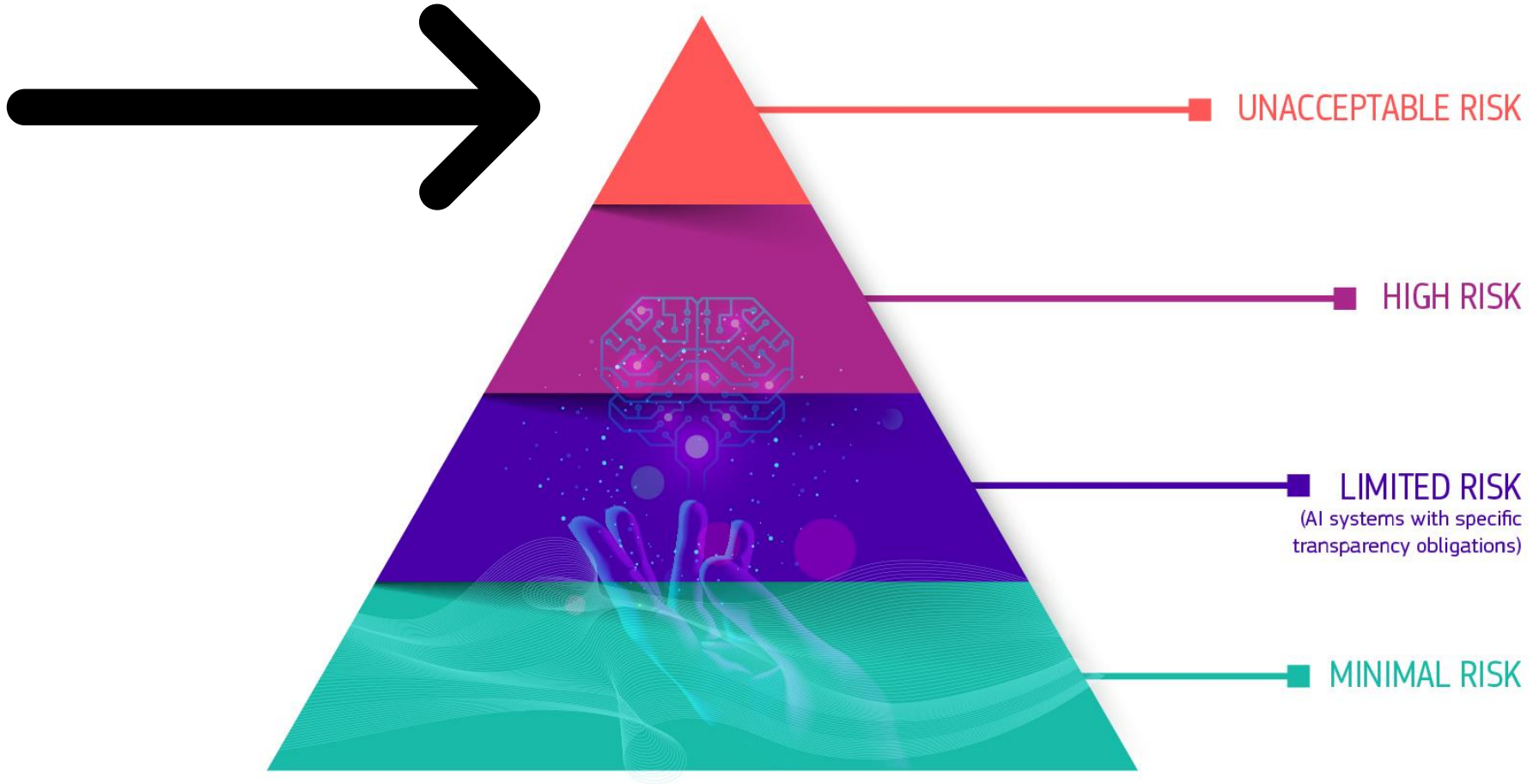
- **(i) receives machine and/or human-based data and inputs,**
- **(ii) infers how to achieve a given set of human-defined objectives using learning, reasoning or modelling implemented with the techniques and approaches listed in Annex I, and**
- **(iii) generates outputs in the form of**
  - **content (generative AI systems),**
  - **predictions,**
  - **recommendations or**
  - **decisions,**
  - **which influence the environments it interacts with;**

Risky AI?



Source: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/excellence-trust-artificial-intelligence_en


UNACCEPTABLE RISK
HIGH RISK
LIMITED RISK
(AI systems with specific transparency obligations)
MINIMAL RISK


UNACCEPTABLE RISK
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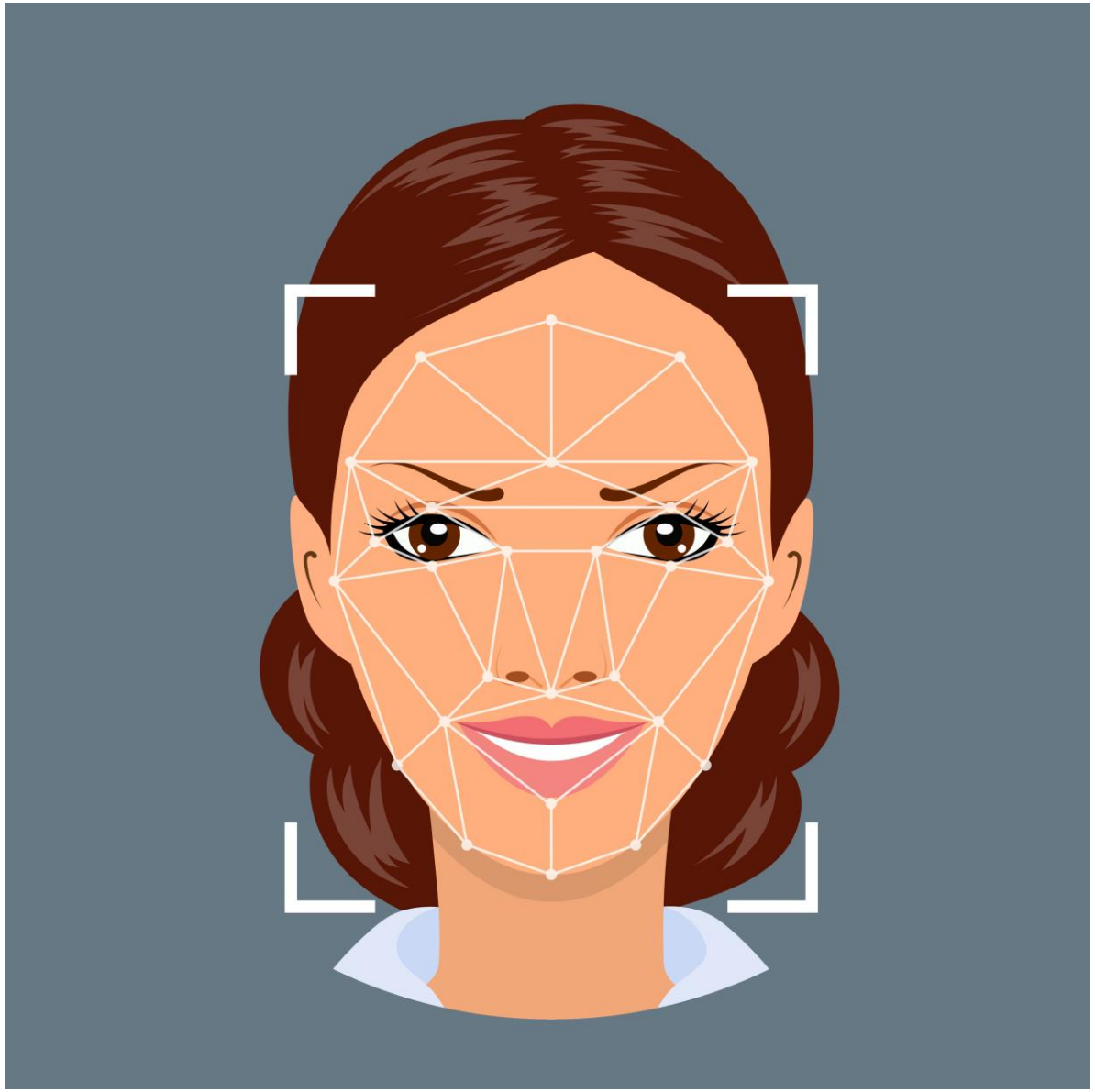
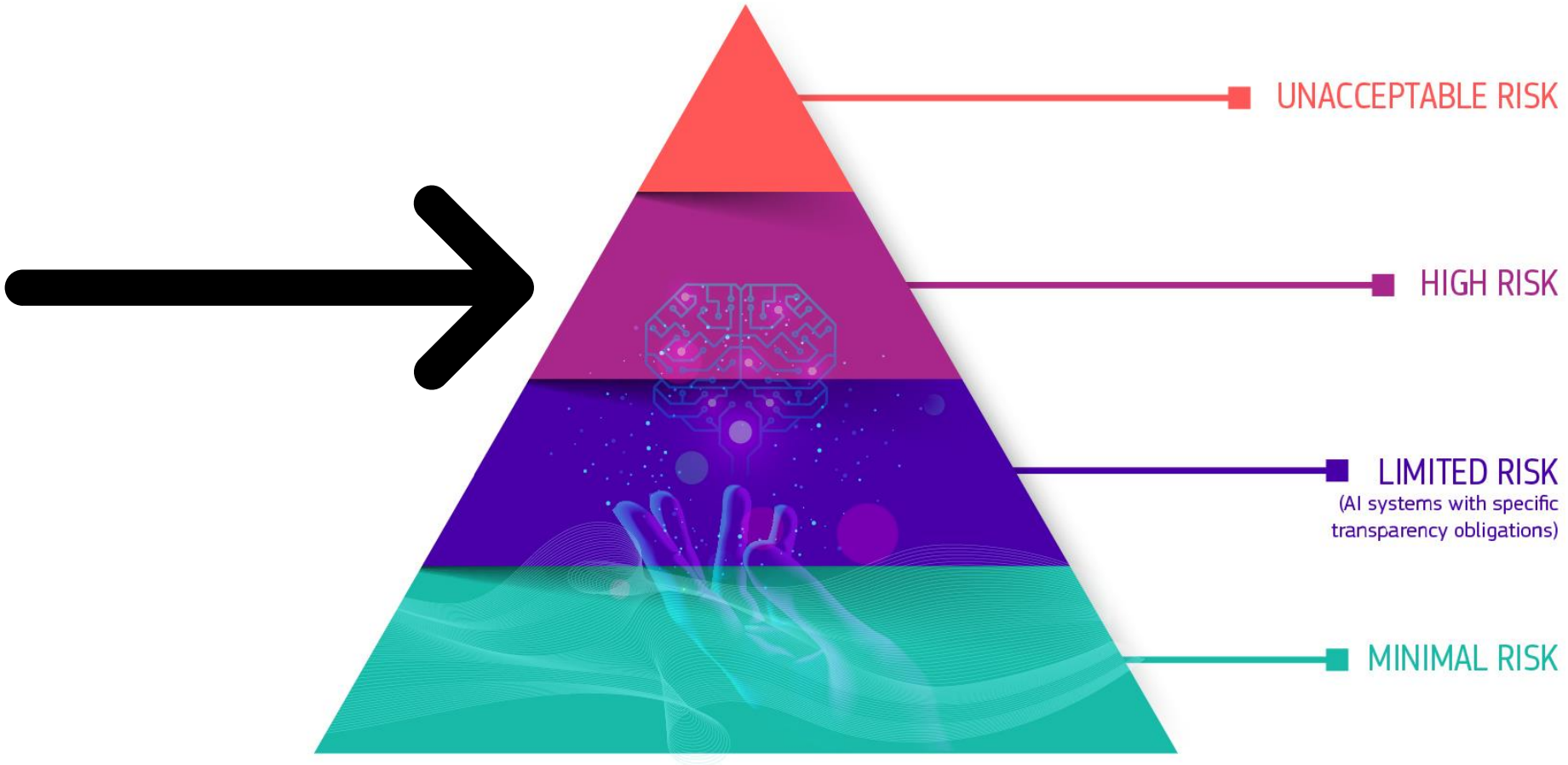
MINIMAL RISK

Prohibition 4

- ‘Real time’ remote biometric identification systems
- in publicly accessible spaces
- for the purpose of law enforcement
- (prohibited unless exceptions apply).



Source: Colourbox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What are high-risk AI systems?

- AI as safety component of some products
- Stand-alone AI systems

Product-related high risk AI systems

AI as safety component of some products

- subject to third party prior conformity assessment under EU law
- e.g., machinery, medical devices

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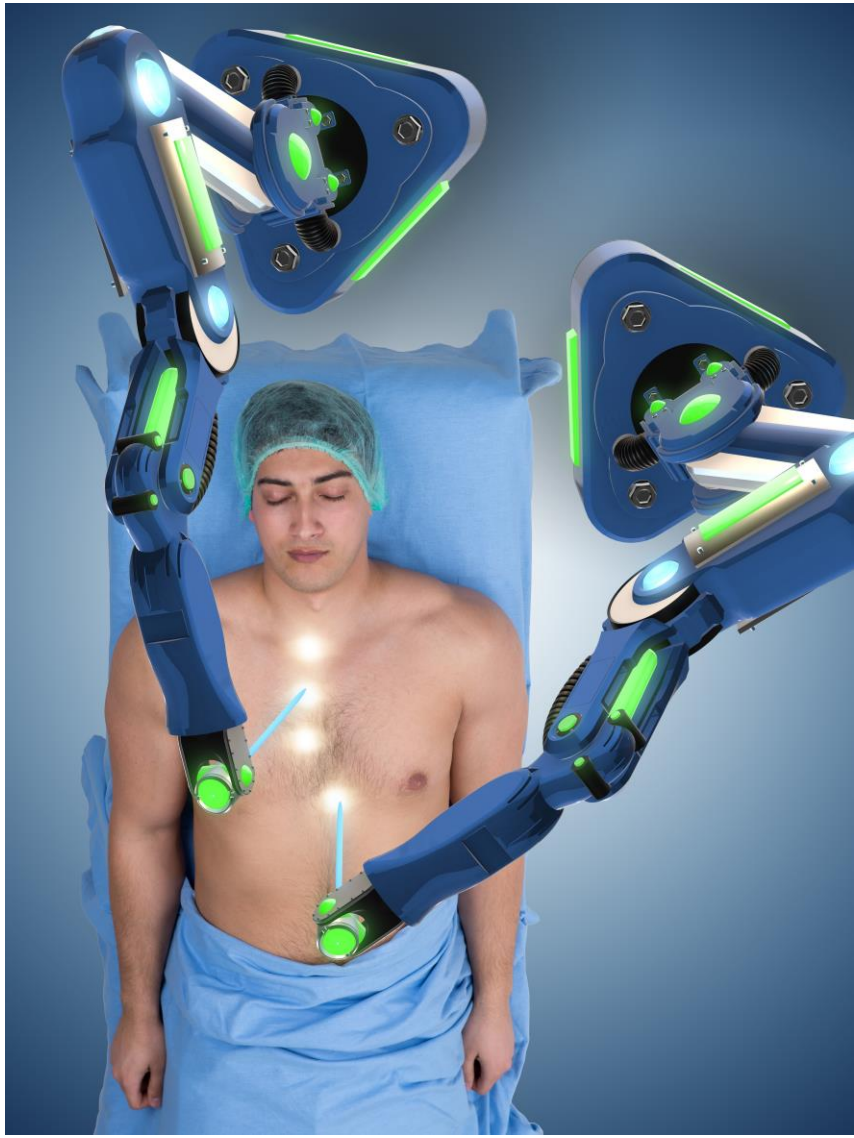


Source: Colourbox

Stand-alone AI systems (mainly fundamental rights implications)

1. Biometric identification and categorisation of natural persons
2. Management and operation of critical infrastructure
3. Education and vocational training
4. Employment, workers management and access to self-employment
5. Access to and enjoyment of essential private services and public services and benefits
6. Law enforcement
7. Migration, asylum and border control management
8. Administration of justice and democratic processes

Requirements for high-risk AI systems

Art. 9: Risk management

Art. 10: Data & data governance

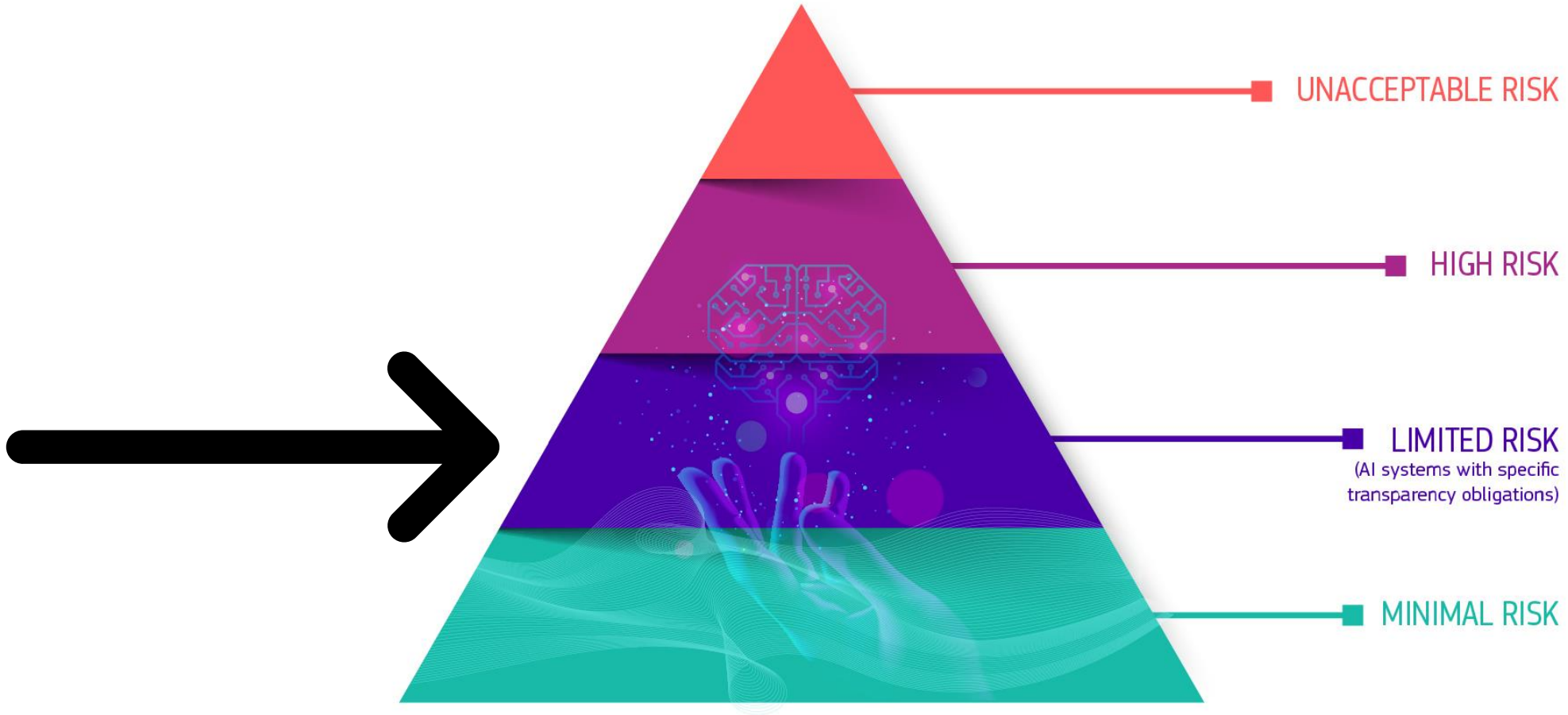
Art. 11: Technical documentation

Art. 12: Record-keeping

Art. 13: Transparency and provision of information to users

Art. 14: Human oversight

Art. 15: Accuracy, robustness and cybersecurity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Chatbots & deep fakes

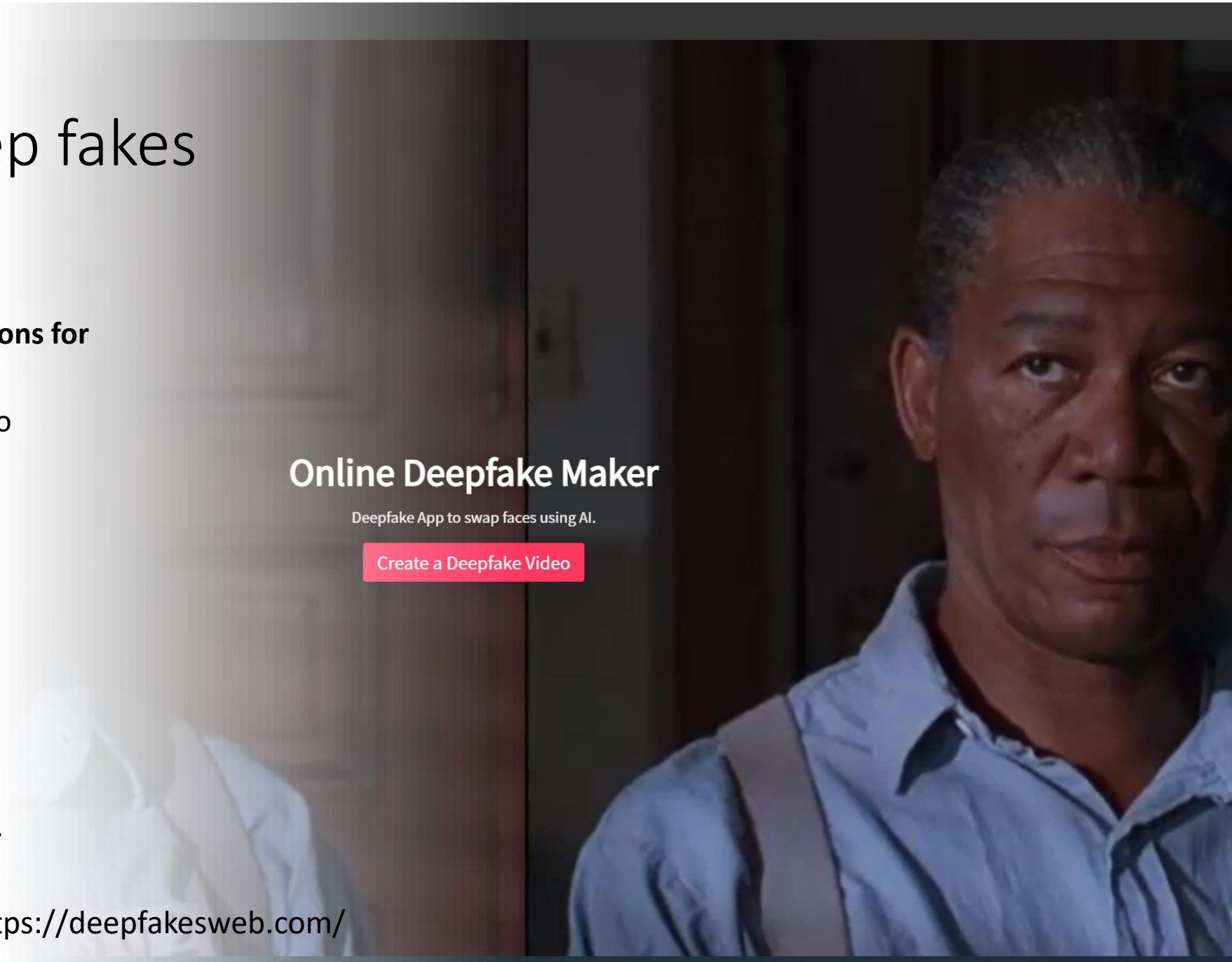
Article 52: Transparency obligations for certain AI systems

Requires AI systems make clear to humans that they are AI systems

- Chatbots
- Deep fakes

Exceptions

- Unless obvious
- Law enforcement
- Freedoms of expression, art, …



Source: https://deepfakesweb.com/