Artificial Intelligence in Development and Humanitarian Work

Promises, Paradoxes, and Perils

Project: "Risks and Opportunities of the AI Predictive Models in the International Development and Humanitarian Field"

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A Project of:
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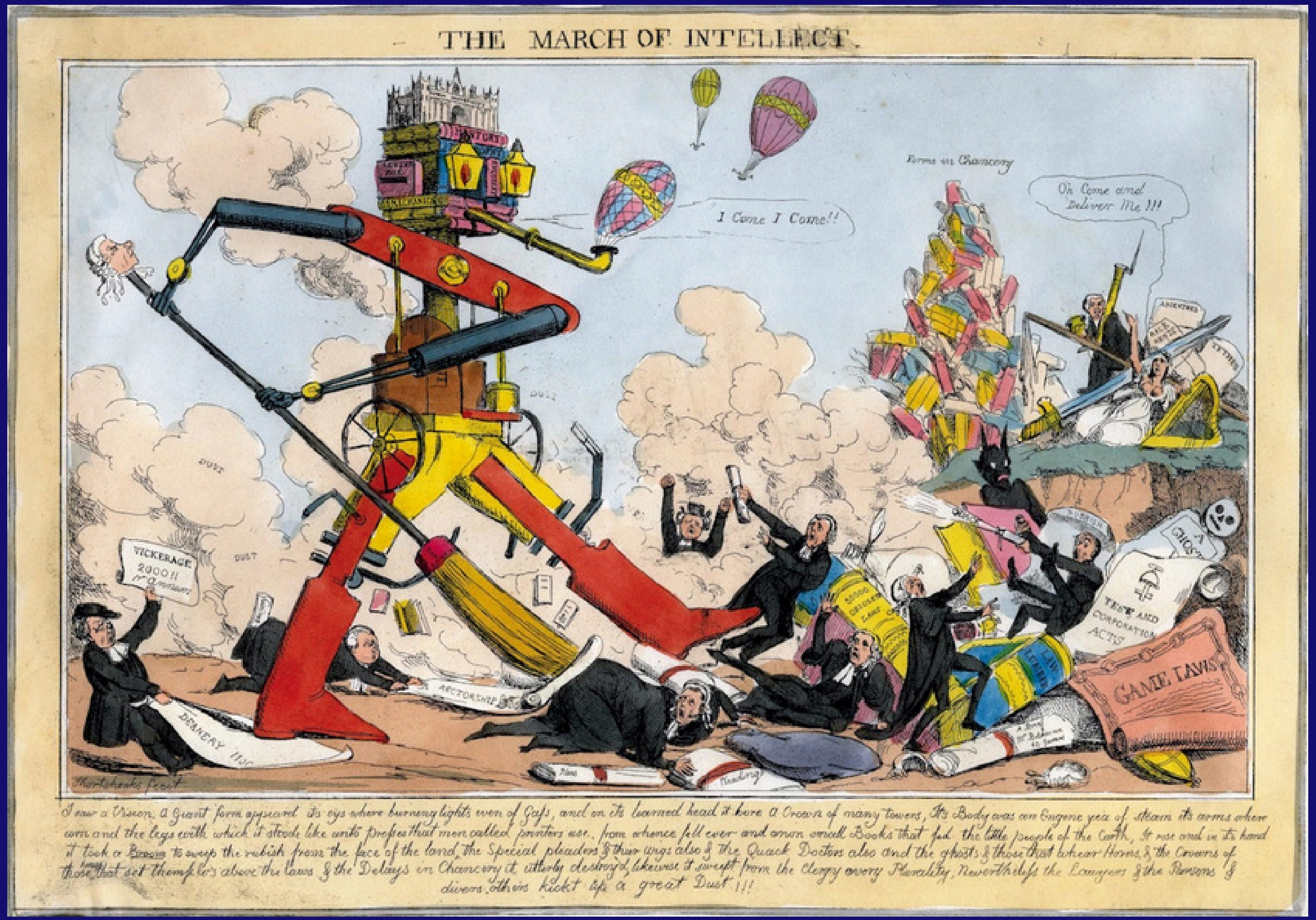


Guiding questions

- How are **predictive and generative AI** being integrated into development and humanitarian practices?
- What are **the social, ethical, and operational challenges** arising from their use?
- To what extent do these technologies **contribute to—or detract from—the achievement of SDGs**?

10 Takeaways from the Research



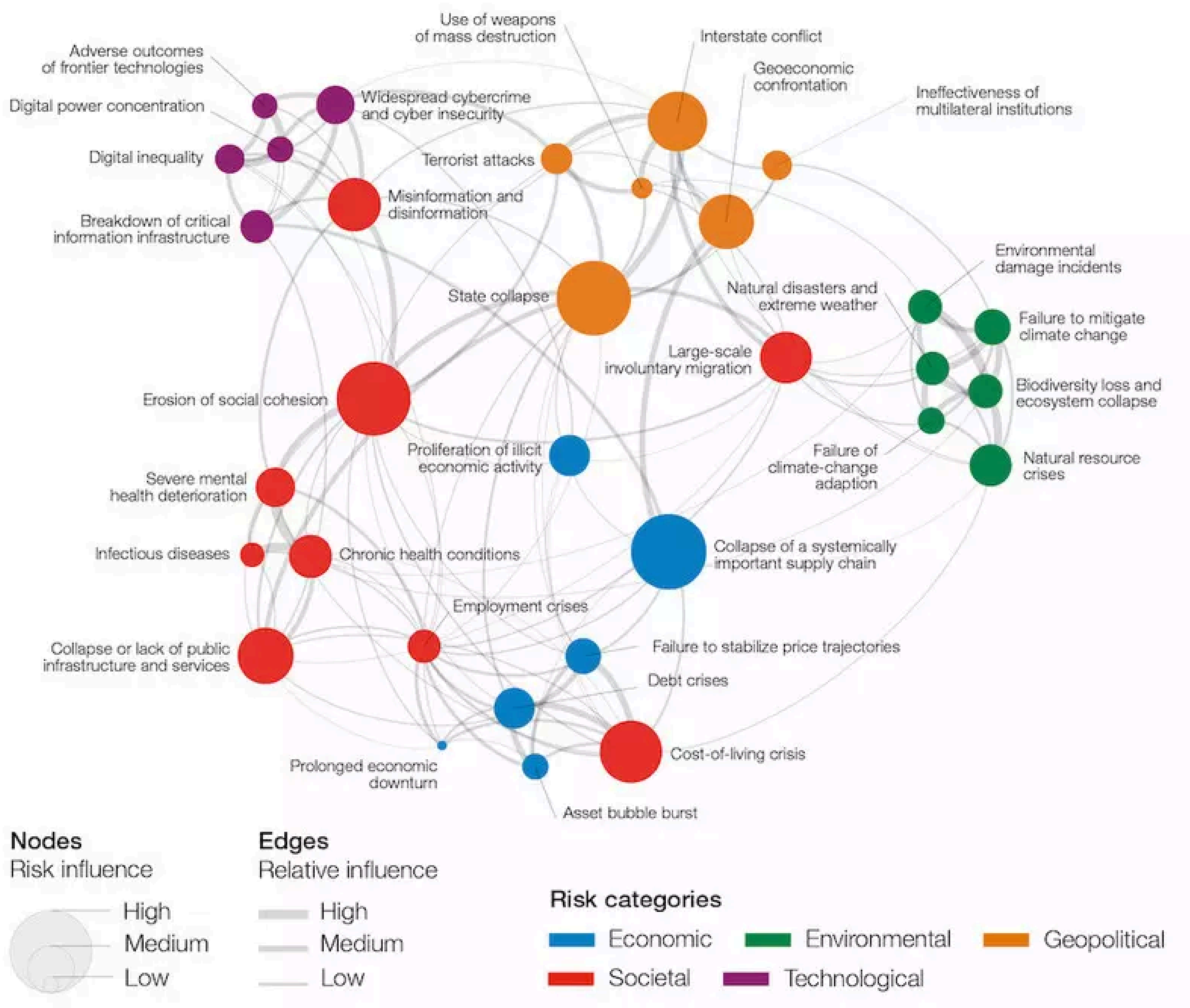
ps. How many baby ducks are in the photos?

We live in Polycrisis.

Multiple, interconnected crises—such as climate crisis, wars, inequality, decline of democracy, and technological disruptions—are happening simultaneously.

AI systems do not emerge in vacuum. Their design, development and deployment are deeply embedded in polycrisis, as well as influenced by historical, cultural, and ideo-political contexts, beliefs, and powers.

For development practitioners recognising this is crucial: **AI is not just (*any*) technology; AI is not a neutral technology;** and, as a socio-technical artefact, **AI embeds politics.**



Source: World Economic Forum, Global Risks Perception Survey 2022-2023

AI is magic. AI is fragile.

When we displace AI from controlled environment to everyday life (streets, schools, offices, etc.) its fragility emerges.

The "wow effect" of AI is undeniable—it can recognize faces, generate text, even beat humans at games.

But this same AI can fail catastrophically, leading to real-world harm.

If AI struggles in urban environments, what happens when it's deployed in **humanitarian settings**—where life and death are at stakes?

AI is already deeply embedded in Development and Humanitarian work.

This research presents a preliminary taxonomy of AI in humanitarian work, identifying:

- 5 main categores
- 16 use cases
- Nearly 30 real-world examples

But is AI truly helping those most in need?
More research is needed to **evaluate and collect independent evidence** whether AI-driven initiatives are genuinly supporting those most in need.

1. Predictive AI: using techniques such as neural networks, regression analysis and decision trees, predictive AI analysis historical and real-time data to forecast future events, enabling proactive responses to humanitarian crises. Predictive analytics can also support decision making by examining data or content to answer the question "What should be done?" or "What can we do to make ___ happen?".[64]

2. Generative AI: employing techniques such as Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), and Natural Language Generation (NLG) to create new content based on existing data. The content generated can be text, image, audio, video, synthetic data or code generation. Generative AI is used in the humanitarian field in multiple ways, such as: synthesise data, generate multilingual reports, simulate disaster scenarios, and produce creative content for awareness.

3. Assistive AI: are designed to assist humanitarian organisations and responders in various tasks, ranging from data analysis to communications and crisis mapping, utilising techniques such as machine learning, knowledge representation and reasoning, computer vision and NLP.

4. Optimisation AI: is employed in the humanitarian field to help improve decision-making, resource allocation, and operational efficiency. By using a range of techniques such as linear programming (LP), genetic algorithms (GAs), simulated Annealing (SA), particle swarm optimisation (PSO), reinforcement learning (RL), Bayesian optimisation—optimisation AI aims to provide the best possible solutions to complex problems, ensuring effective responses in crisis situations.

5. Facial Recognition AI (e.g. deep learning, etc.): is one of the prominent–and the most controversial–applications of AI, utilising various techniques and algorithms such as feature-based and holistic methods, eigenfaces, local binary patterns, and deep learning. These techniques are employed to analyse and compare facial features for identification and verification purposes.

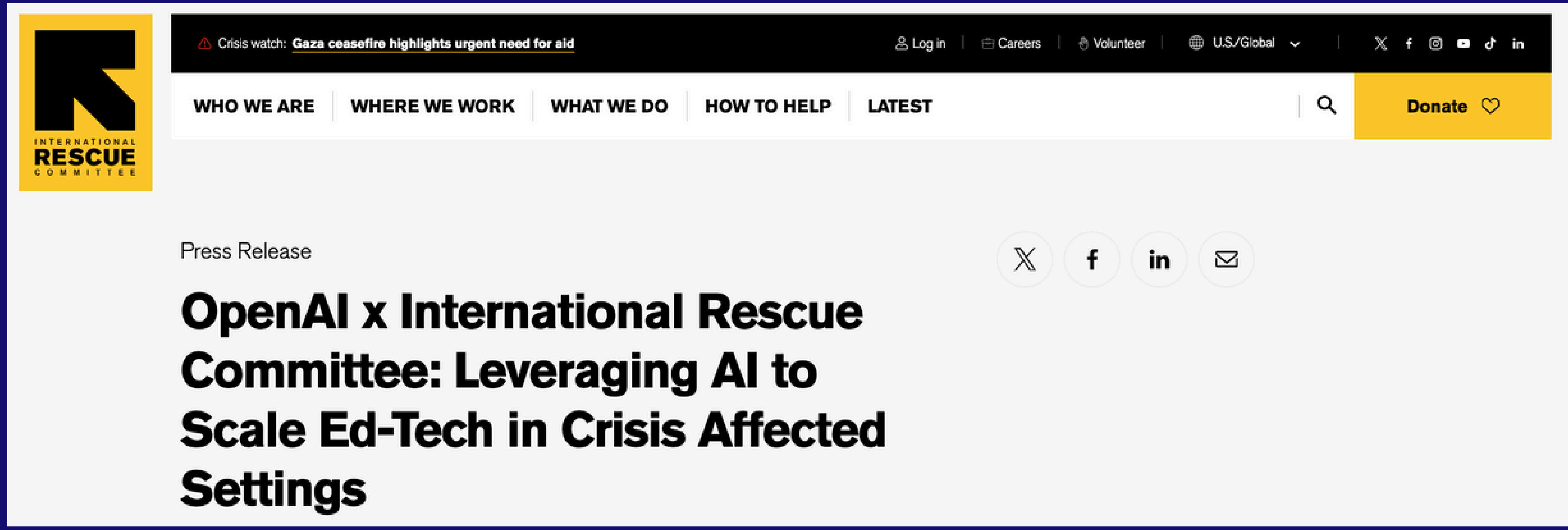
The “AI for Good” narrative is overstated, dubious, and problematic.

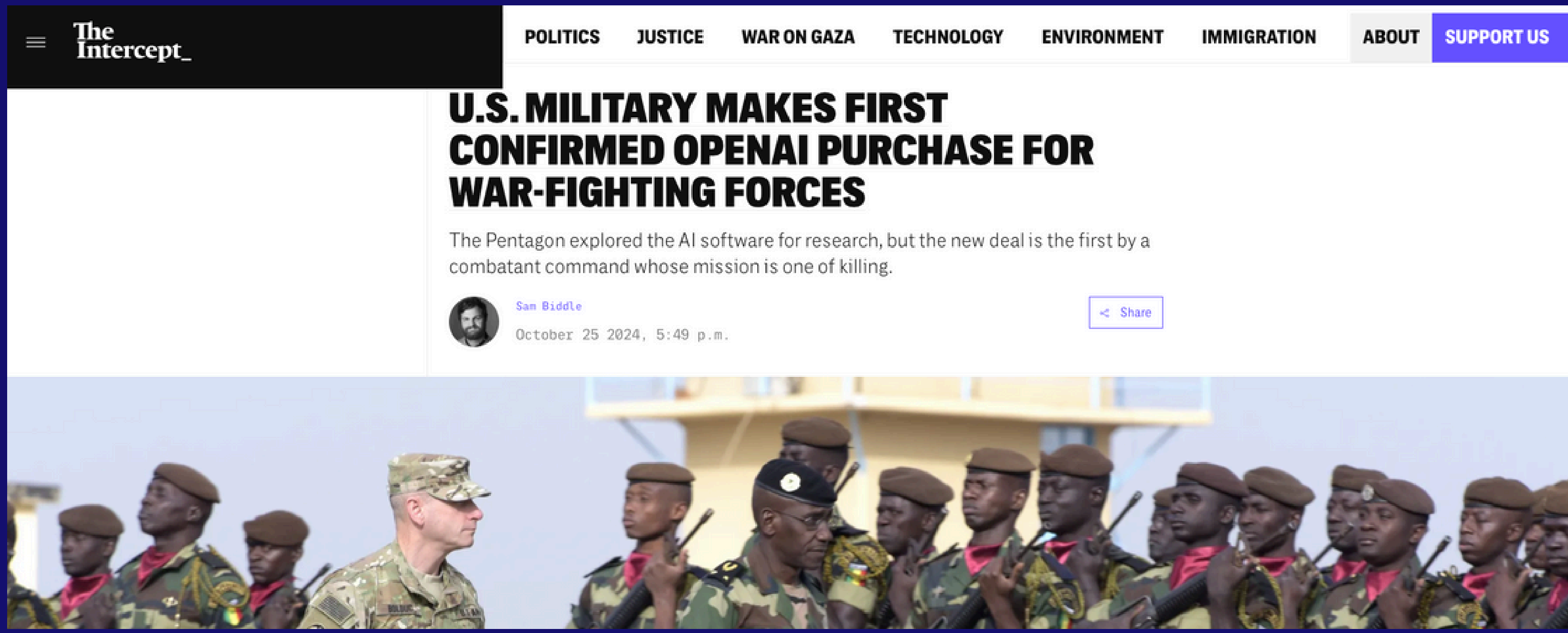
The definition of ‘AI for Good’ remains unclear, lacking reliable benchmarks to measure real-world impact (Cowls et al., 2021).

Researchers propose using the SDGs as a framework (AI×SDGs) to evaluate impact.

However, AI-driven projects are unevenly distributed across SDGs, with some areas (health) receiving significant attention while others (gender equality, justice, and governance) remain neglected.

Crucially, SDGs themselves have regressed in the last five years, impacted by global crises such as COVID-19, wars, climate change, and economic instability.





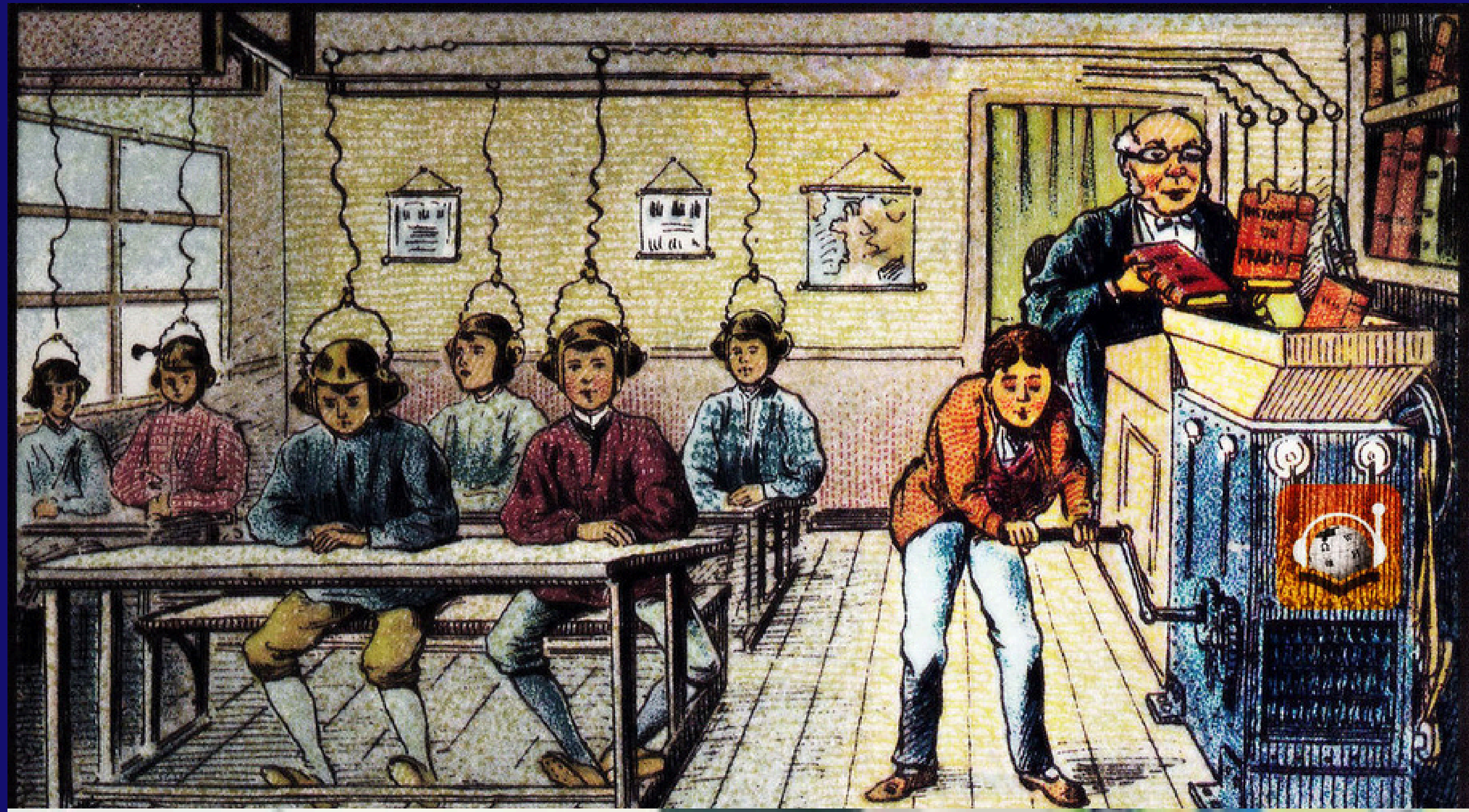
Education is more than personalisation and learning.

For **more than a decade** but without much public awareness, AI-enabled technologies have increasingly been used in education. Research into AI in education (AIED) dates back over **forty years**.

AIED goes far beyond generative AI—there are at least **twenty-five distinct categories** of AIED, including:

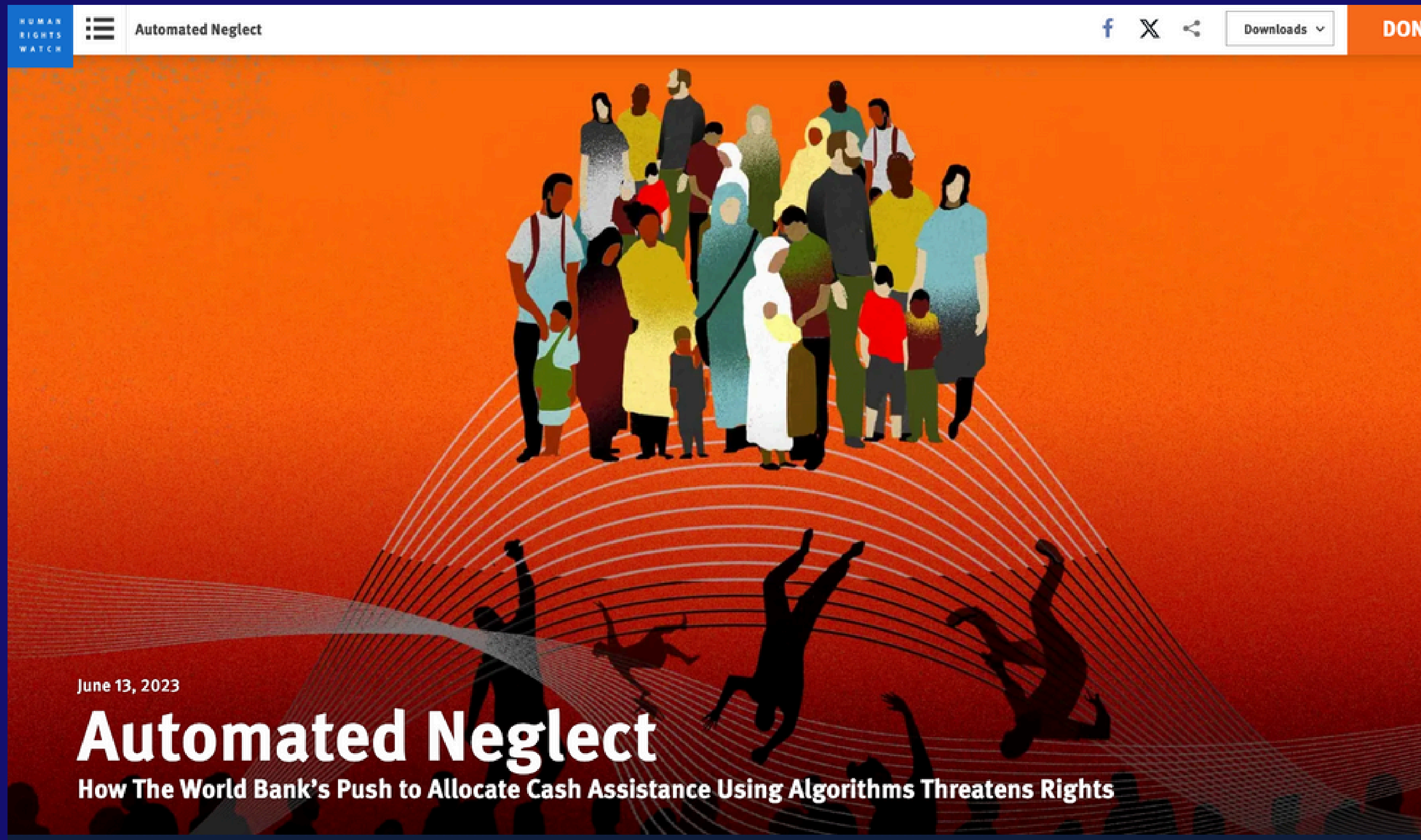
- **student-focused AIED** (adaptive tutoring systems, support chatbots, etc.);
- **teacher-focused AIED** (e.g. plagiarism detection, resource curation, AI-driven assessments, etc.);
- **institution-focused AIED** (e.g.AI-assisted admissions, e-proctoring, scheduling, security, etc.).

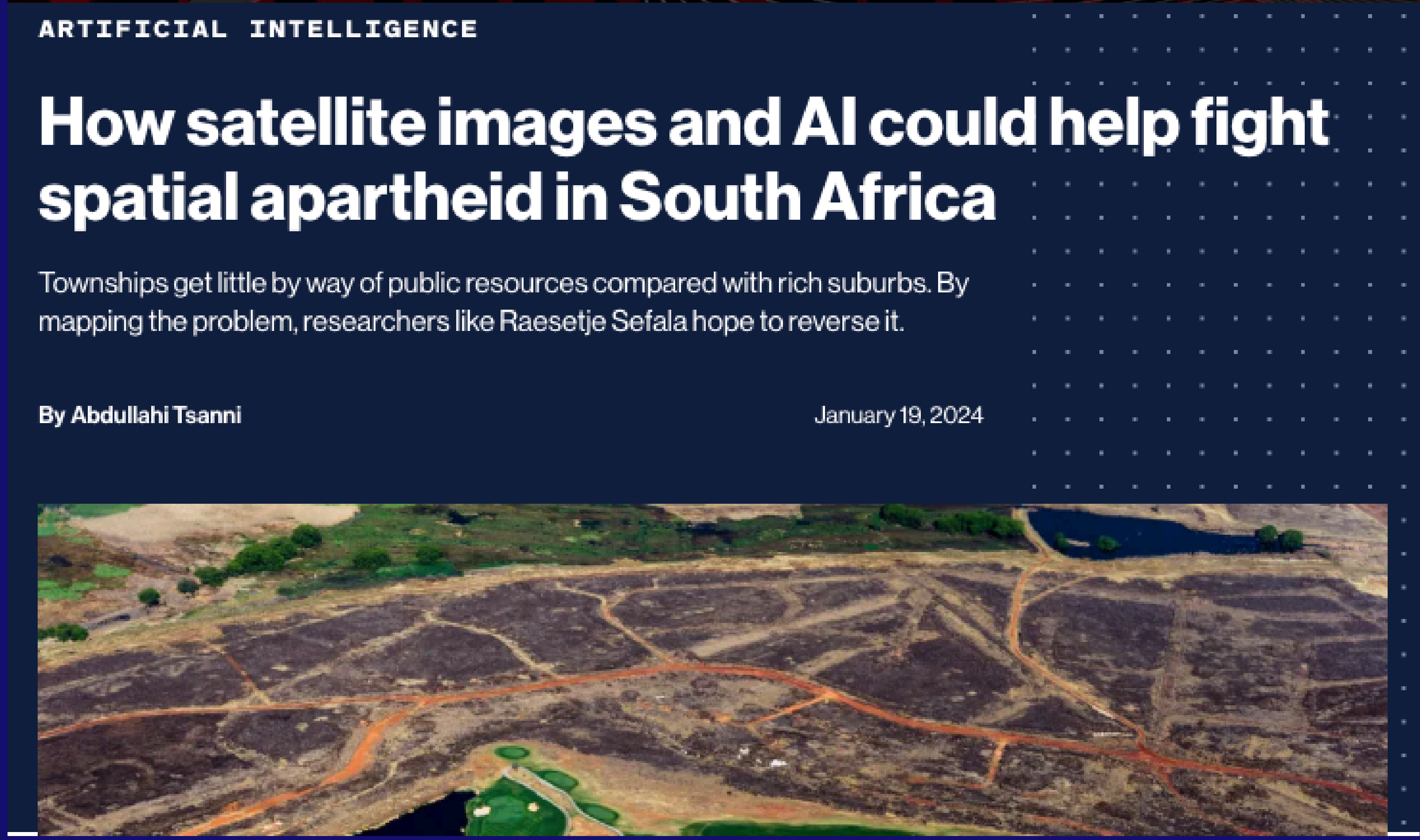
Despite advancements, **there is no robust independent evidence** at scale for the efficacy, safety or positive impact of AI systems being used in education (Holmes, 2023; Council of Europe, 2024).



Inequality is too complex to be solved by AI alone.

However, a mix of complementary technologies (satellite imagery + Machine Learning), open and diverse data, and local knowledge can help expose inequalities and collect evidence for policy change.





The AI–Climate Dilemma: the Paradox of Paradoxes

Some of the areas where AI and ML may play role in addressing climate-related areas:

- Climate Modelling, Prediction, and Disaster Forecasting
- Monitoring and Conservation
- Optimisation in energy and resource management
- Urban sustainability and resilint city planning

But, the impact of AI in environment has high costs:

- ChatGPT3 trained using a cluster of 10,000 Graphics Processing Units (GPU).
- ChatGPT4 trained on 25,000 GPUs.
- ChatGPT5 rumored to use 50,000 GPUs.
- Musk's new x-AI data center 100,000 GPUs.
- A single rack of 72 Nvidia Blackwell GPUs will draw 120kW, or about as much as 300 European homes.
- AI data centers (for ML training) are estimated to be ~1GW range (and cost about 20 billion USD)
- AI inference data centers (for serving AI users) are estimated to be in the 100 million MW range.
- 2030 estimates: 5-15% of all electricity (in US). *(Tuomi, 2024)*

How should elderly people stay warm when there are power cuts due to data centres overloading the electricity grid?

During power cuts, especially if they're caused by high demand from data centers or other factors, elderly people can be more vulnerable to cold temperatures. Here are a few strategies to help them stay warm:

1. **Layering Clothing**: Wearing multiple layers of clothing, including thermal underwear, wool sweaters, and warm socks, can help trap body heat. Keep the head, hands, and feet covered as they are areas where heat is lost the quickest.
2. **Use Blankets and Sleeping Bags**: Thick blankets, sleeping bags, and even insulated emergency blankets can help retain warmth. Wool or fleece are particularly effective for warmth.
3. **Hot Water Bottles or Heating Pads**: If you have access to hot water, filling a hot water bottle can provide warmth for several hours. Heating pads can also be a good option if batteries are available.
4. **Stay in a Smaller Room**: Close doors to unoccupied rooms, and try to keep the living space small. This can help conserve the warmth in one area.
5. **Move Around When Possible**: Encourage movement, as this helps generate body heat. Simple activities like walking around the house or doing light exercises can improve circulation.

Credits: Dan McQuillan

If AI & algorithms are not governed, they become the new government.

Europe:

- EU AI Act, European Commission (2024)
- The Framework Convention on AI, the Council of Europe (2024)

United States:

- Trump revoked Biden's AI executive order, "Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence."
- Announced $500 billion 'Stargate Project' for AI infrastructure.

China:

- Implemented "Interim Measures for the Management of Generative AI Services" to regulate public-facing GenAI models, during summer of 2023.

If the algorithms decide what opinion and expression enters the public sphere, these algorithms become, de facto, regulation (Tuomi, 2025).

Reccomendations

1. Democratisation of expertise and policymaking in times of AI

- Science is a crucial but **not exclusive form** of relevant knowledge.
- Whereas, excessive reliance on experts' assessment might lead to **depoliticisation and further distance of citizens from political participation**
- Towards the **extended participation model** of interaction between science, expertise and policy, where citizens are at the same time (while to different degrees) users, critics and producers of knowledge. A plurality of perspectives is considered as enhancing both procedural legitimacy (through inclusiveness) and quality of knowledge (through extended peer review).

2. Six key recommendations:

- **Ethics by Design:** Embed ethical standards in AI development & policymaking.
- **Contextual & Transdisciplinary AI Research:** Support diverse, real-world AI applications.
- **Critical AI Literacy:** Educate policymakers & citizens on AI's implications.
- **AI Transparency & Fairness:** Establish oversight bodies to prevent bias & discrimination.
- **Sustainable AI Development:** Monitor & mitigate AI's environmental impact.
- **Foresight & Anticipatory Analysis:** Use speculative design to prepare for AI's future.

3. AI Hype-Reality Gap Model

Recommendations

AI Hype-Reality Gap Model

A practical tool that aims to help policymakers, practitioners, and other stakeholders **critically assess the discrepancy between the expectations created by AI hype and the actual, empirical and independent evidence and outcomes achieved in real-world applications.**

Dimensions	Hype	Reality	Gap Analysis
1. Promised Capabilities vs. Actual Functionality	High-performance claims, revolutionary features, transformative impacts	Actual performance in the given context; independent empirical validation of capabilities	Identify discrepancies between promised capabilities and functionality in real-world use
2. Claimed Evidence vs. Independent Evidence	Claims of efficacy and impact based on internal or anecdotal evidence provided by developers or vendors	Results from independent and peer-reviewed studies, third-party evaluations/audits, and on-the-ground observations of AI impacts	Assess reliability and validity of claimed evidence; identify any discrepancies between claimed and independently verified results
3. Expected Outcomes vs. Measured Impact	Projected benefits like improved efficiency, significant cost savings, developmental gains, or correct predictions	Tangible outcomes and any unintended consequences observed post-implementation	Assess how actual outcomes measure up to promised benefits, including any unintended impacts
4. Resource Requirements vs. Available Resources	Assumptions about the availability of necessary data, infrastructure, and expertise	Real availability and quality of resources such as data access, infrastructure robustness, and local expertise	Evaluate gaps in resource quality, availability, and accessibility
5. Scalability Claims vs. Practical Scalability	Claims that AI solutions can be easily scaled across various regions or sectors	Practical challenges in scaling, including contextual, logistical, legal, and cost-related limitations	Identify specific barriers to scaling (e.g., regional variability, cost constraints, legal compliances, etc.)
6. Ease of Integration vs. Integration Challenges	Promises of seamless integration with existing systems and processes	Actual difficulties in integrating with current infrastructure, compatibility issues, resistance to change	Document integration barriers and evaluate the feasibility of promised ease of integration
7. Ethical Considerations vs. Ethical Implementation	Claims that AI technology aligns with ethical standards and promotes social benefits	Observed ethical impacts, including unintended negative consequences or breaches in practice	Review ethical gaps and ensure alignment with community and organisational values

Thank you!

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