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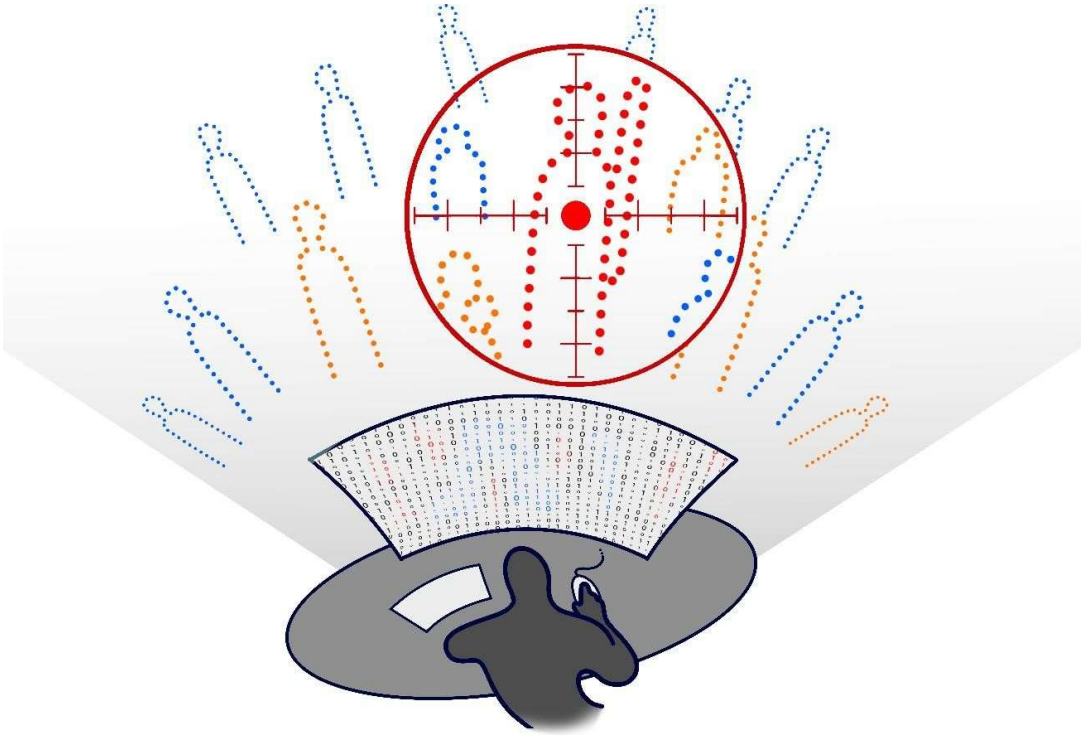

Algorithmic targeting: the role of artificial intelligence in Israeli strikes in Gaza and its ethical implications

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Artificial intelligence (AI) has contributed to shaping the conduct of Israeli military operations in Palestine since the crisis of April-May 2021. Sparked by tensions in East Jerusalem, it degenerated into an 11-day conflict between Israel and Hamas before an Egyptian-brokered ceasefire put an end to hostilities[1]. In this context, during the Israeli operation "*Guardian of the Walls"*, a senior officer in the intelligence corps of the Israel Defense Forces (IDF) declared that "*artificial intelligence was a key component and power multiplier in fighting the enemy*"[2]. The Israeli army indicated that it had struck

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"*over 1,500 terror targets*"[3] during the first month by using the *Habsora* system (*The Gospel*, in English).

In comparison, in the first thirty-five days of the conflict in Gaza, launched after the terrorist attacks perpetrated by Hamas and the Palestinian Islamic Jihad (PIJ) on 7 October 2023, the Israeli authorities announced that they had hit more than 15,000 targets[4]. This substantial increase in bombing is the result of the particular context of Israel's massive retaliation. With or without AI, the destruction would perhaps have been the same; in the absence of an alternative reality, it is impossible to say. What is, however, clear is that the strikes on the Gaza Strip have been characterized by an increased use of AI for the determination of targets. The *Habsora* system has revolutionized the targeting process by generating up to 100 targets per day, whereas human analysts used to identify around 50 per year[5]. In April 2024[6], the independent Palestinian-Israeli investigative newspaper *+972 Magazine* revealed that two additional AI-based systems – *Lavender* and *Where's Daddy* – also played a key role in automating the process of target selection and their geolocation.

The use of AI in Gaza has been heavily criticized by the press, non-governmental organizations[7] (NGOs) as well as United Nations (UN) experts[8]. In a statement issued by the Israeli army to legitimize the use of these technologies, a senior intelligence official stated that this system allowed the identification of targets for precision strikes "*causing great damage to the enemy and minimal damage to non-combatants*"[9]. However, these promises of precision contrast with reality, as the use of AI has resulted in significant civilian casualties[10]. While the exact toll remains uncertain, Gaza authorities reported over 45,000 deaths as of 16 December 2024[11].

How can it be explained that, despite the massive destruction observed, the number of civilian casualties caused, and the demonstrations of force orchestrated by Hamas in the context of hostage and prisoner exchanges, the use of AI for targeting is justified as an operational advantage even though it raises major ethical concerns linked to the automation of decision-making?

To answer this question, the present text proceeds in three steps. First, it presents the operating principles of Israel's three AI systems, and the abuses associated with them. Second, it discusses the ethical issues related to the lack of human control and the conditioning of the decision-making process. Third, it addresses the need to distinguish between the notions of "meaningful human control" and "nominal human input" as highlighted in the communication from the State of Palestine to the UN.

1. Operating principles of the three Israeli AI systems

The integration of AI into Israeli military operations is rooted in the multi-year *Momentum* program (*Tenufa*, in Hebrew), developed in 2020 under the leadership of Israeli Army Chief of Staff Aviv Kochavi. This program is based on a long-term vision to create a more connected and lethal army, able to destroy enemy capabilities in the

shortest possible time[12]. The integration of new technologies, such as advanced information processing, digital connectivity and automation[13] is an essential dimension of this program[14]. The aim is to exploit the potential of these innovations to develop methods that will considerably reduce the time between the identification of targets by a sensor and their elimination[15] "*within seconds*"[16]. In this way, the *Momentum* program proposed to transform the IDF into a "'*smart war machine*"[17].

In the wake of the *Momentum* program, the book "*The Human-Machine Team: How to Create Synergy Between Human and Artificial Intelligence That Will Revolutionize Our World*", written by Brigadier General Yossi Sariel, former commander of the elite Israeli intelligence Unit *8200*, has also been central to the conceptualization of AI integration within the military ranks. Sariel promotes the idea of a machine capable of rapidly processing enormous quantities of data, with the aim of resolving what he calls the "*human bottleneck*"[18] in target identification and validation. According to Elke Schwarz, a lecturer at Queen Mary University of London, AI-based targeting systems have made it possible "*to statistically assess what constitutes a potential target*"[19].

+972 Magazine has highlighted the importance of the three AI-based targeting systems mentioned previously in the recent Israeli counterattack in Gaza: *Habsora, Lavender* and *Where's Daddy*. These systems combine advanced analytical capabilities, massive data processing and real-time connectivity, transforming decision-making dynamics on the battlefield. Each one of them has been designed with distinct but complementary objectives. To date, there is relatively limited information on the type of data involved and how they are processed[20]. *Habsora* is reported to focus on buildings and structures from which, according to the Israeli army, militants operate[21]. *Lavender* goes one step further, generating tens of thousands of human targets based on their supposed or suspected affiliation to the armed branches of Hamas and PIJ[22]. The system analyzes the communication patterns of the Gazans, such as frequent changes of telephone number or interactions with numbers linked to these organizations[23]. The results are then processed by *Where's Daddy*, which tracks targets to their family homes[24]. The system warns officers upon their return enabling a strike to be executed, even in the presence of civilians[25]. All three programs are built on the principle of "*machine learning*" which enables AIs to "*draw inferences from data and recognize patterns without explicit instructions*"[26]. Thus, during the first weeks of operation "*Swords of Iron*"[27], name given by *Tsahal*[28] to its military offensive on Gaza, *Lavender* helped generate data listing 37,000 persons as potential targets.

AI-based decision support systems (AI DSS) must integrate and analyze data from a variety of sources to function. These data come from the myriad surveillance methods that Israel has been using for decades to control the Gaza Strip and the occupied West Bank: drones, satellites, video surveillance cameras, communications interception systems and the detection of individuals, objects and buildings through sensory data[29]. According to a former member of Unit *8200* in charge of electromagnetic intelligence, all phone conversations are intercepted by the Israeli army via built-in devices on phones

imported into Gaza, passing through the Kerem Shalom crossing point[30]. In 2022, the commander of Palmachim air base, Omri Dor, stated that "*the whole of Gaza is 'covered' with unmanned aerial vehicles that collect intelligence 24 hours a day*"[31]. Similar devices are used to gather the data required for AI operations.

The combined use of advanced technologies has enabled the Israeli army to expand and intensify its operations at an unprecedented rate. The use of AI has dramatically increased the number of targets produced, far surpassing what human teams could have determined without their support[32]. A senior Israeli officer who has used *Lavender* declared bluntly that automation was a response to the "*constant push to generate more targets for assassination*"[33]. This logic is part of a process in which speed of execution becomes an operational imperative. Indeed, the operators of these AI systems were under strong constraints to identify as many targets as possible and to eliminate them "*very quickly*"[34]. According to *+972 Magazine*, intelligence officers apply predefined "collateral damage" thresholds to approve strikes on targets in residential areas[35]. A degree 5 directive, for instance, authorizes a strike resulting in the death of five civilians or less[36]. Since 7 October, these thresholds have been raised: Israeli officers have been authorized to accept up to 20 civilian deaths per Hamas fighter, and more than 100 for a senior commander[37]. Early in the operation, the IDF overlooked the AI false-positive rate estimated at 10% and "*intentionally targeted alleged militants in their homes with unguided 'dumb bombs'[38] despite an increased likelihood of civilian harm*"[39].

The acceleration of the targeting process and of the execution time for a specific strike is part of a broader approach, in which the acceptability of civilian casualties has already been defined independently of the use of AI. These systems have arbitrarily – and through human intervention – integrated a high tolerance for the number of civilian casualties per target, disregarding the proportionality principle of international humanitarian law (IHL). The biases conditioning the functioning of AIs thus appear to be deeply flawed and at odds with the legal rules governing armed conflict[40].

2. Ethical concerns regarding the automation of the decision-making process

Disclosures from Israeli officers have sparked strong reactions and outrage across the academic and media spheres, exposing the ethical issues behind the dehumanization of the targeting process. They partly joined the debate on lethal autonomous weapon systems (LAWS, often referred to as "*killer robots*"), already marked by ethical and legal concerns that have led to international mobilization. A notable example is the NGO coalition "*Campaign to Stop Killer Robots*" which has been advocating for a treaty to prohibit LAWS[41].

While debates are relatively exhaustive on issues of autonomy in the decision to use lethal force, the use of AI not directly associated with weapon systems is addressed more discreetly[42]. Yet, the concerns raised against LAWS – such as the loss of human

control, targeting errors, or ethical implications – also apply to the three Israeli AI systems discussed above. Automation profoundly transforms the way strikes are decided, reducing the role of human operators to mere validators of machine-made choices. Although they are not LAWS capable of killing without human intervention, AI DSS directly participate in targeting and significantly influence military decisions. It is therefore essential to highlight the abuses associated with these practices.

First and foremost, an overreliance on AI systems has resulted in inadequate supervision, despite a clear awareness of algorithmic biases[43]. Internal verification attested to an accuracy of 90%, meaning that on the scale of the Gaza operation, around 3,700 of the 37,000 designated targets were in fact people not affiliated to the military wing of Hamas and "*erroneously placed on a kill list*"[44]. Amélie Férey and Laure de Roucy-Rochegonde, researchers at the French Institute of International Relations (Ifri), also put the emphasis on faulty algorithm parameters. For example, the identification of Hamas members was based on frequent changes of telephone number. This method turned out to be imprecise, since this change was also widespread among "*human rights activists, journalists, but also people displaced because of the bombings*"[45]. Algorithmic biases were already a major issue for LAWS causing significant damage, sometimes without being detected or corrected in time[46].

This highlights a deeper issue arising when human oversight is conditioned to be rushed, permissive and ultimately insufficiently attentive to the risk of errors and civilian casualties, dehumanized under the term "collateral damage". This is the essence of the analysis submitted by the State of Palestine to the UN Secretary-General: the use of AI contributes to "*digital dehumanization*"[47]. Targeted individuals are no longer regarded as persons with identities but are instead reduced to a series of data points, including physical characteristics such as body shape, body temperature, skin color, or speed of movement[48] . This approach accentuates discrimination, as one person can easily be mistaken for another on the basis of general criteria.

The question of the dehumanization of targets is also raised in the context of LAWS[49]. The "*Campaign to Stop Killer Robots*" has emphasized that machines, incapable of recognizing humans as persons, exert decision-making power over attacks, which constitutes "*the ultimate form of dehumanization*"[50]. Contextual assessment and discernment thus gradually disappear. By adopting this perspective with its AI systems, the Israeli military has legitimized a vision in which killing is no longer seen as a weighty decision with serious consequences but rather as an optimized way of achieving tactical and strategic objectives. This shift raises the question of meaningful human control over AI in a broader context than that of LAWS; the Israeli case of automated targeting, illustrates the risk of human being becoming an accessory in a decision to use lethal force.

3. Meaningful human control versus nominal human input: a critical reflection

As a result of the over-reliance on AI, targeting recommendations were largely implemented without genuine human control. Soldiers responsible for strike validation "*often served only as a 'rubber stamp' for the machine's decisions*"[51] devoting no more than 20 seconds to strike validation despite being aware of an error rate of around 10% in target identification[52]. Human intervention was often reduced to a simple mechanical act, diminishing the operator's ability to exercise critical judgment before taking action.

Moreover, the IDF did not appear to systematically and rigorously conduct battle damage assessments[53] despite the availability of sources capable of verifying civilian casualties[54]. According to *+972 Magazine*, the assessment was even abolished for low-ranking combatants[55]. Recent testimonies from soldiers indicate that the IDF have gradually reduced human involvement in the decision-making loop, limiting their ability to think critically.

The facts are clear: human contributions that are not based on moral or legal considerations are not sufficient to establish meaningful human control. Although no universal definition has been established, this principle is based on maintaining human operators' control and moral responsibility in the use of weapon systems[56]. It has been a central element of discussions notably within the Group of Governmental Experts (GGE) on Lethal Autonomous Weapon Systems, for several years[57].

Regardless of the definition adopted for significant human control, the approach taken by *Tsahal* does not appear to meet the minimum requirements of this principle. In this respect, the State of Palestine introduced the notion of nominal human input to distinguish the limited involvement of Israeli operators from what would constitute genuine human control. This concept highlights that if human involvement is reduced to the rapid validation of AI-driven decisions[58], it cannot be considered meaningful, as it lacks both discernment and critical assessment of the situation[59].

The Israeli example illustrates the paradox of meaningful human control. The argument for automation is based on the idea that AI accelerates data processing beyond human capabilities[60]. However, this speed comes at the expense of genuine human control. Indeed, an operator cannot fully verify AI-driven decisions without slowing down its functioning to the point of compromising its operational utility.

Conclusion

This text has demonstrated that the challenges posed by AI in armed conflicts align with and expand the ethical and legal debate on its military applications within the framework of LAWS. AI-based targeting systems directly influence lethal decision-making, often without genuine control.

The case of the Israeli systems illustrates how targeting automation can reduce human control to a mere routine validation role. The pressure to act quickly, the conditions in which AI is used, and the inability to challenge its functioning operating through opaque algorithms effectively prevent any meaningful human control. Yet, this dimension is essential for ethical decision-making and compliance with IHL. Civilian casualties in Gaza are not just the result of algorithmic failures. They are the result of deliberate political, military and technological decisions to use systems whose limitations are well known, without sufficient safeguards in place to avoid blunders[61].

Israeli AI systems are not LAWS; they do not kill autonomously. It is human choices that determine how they are used, and it is on these choices that political, ethical, and legal debates should center on. This requires addressing the question of accountability, both for the developers and operators of these AI systems.

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