From *the* Cloud *to the* Landfill: The Case *of the* Agbogbloshie Makerspace Platform *and* Akwasi Bediako Afrane's TRONS

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ABSTRACT

This contribution sheds light on discarded electronics repair in Accra, Ghana. After placing these practices in dialogue with the Western and Eurocentric narratives around the materiality of digital interactions and infrastructure, it delves into two arts and design contexts that gravitate around the electronic waste landfill and processing site of Agbogbloshie (Ghana). The first case study is the Agbogbloshie Makerspace (AMP), a critical making (and unmaking) platform empowering local repairers and dismantlers through open-source collaborative design methods. The contribution then focuses on the work of Akwasi Bediako Afrane, a Ghanaian media artist who re-appropriates discarded computers to critique and speculate on our sociotechnical condition. Situating these initiatives in the light of our broader dominant internet and computing narratives, the article situates the importance of these practices in order to tackle and raise awareness about the planetary electronic waste condition we live in.

Keywords

Agbogbloshie

dominant digital narratives

planned obsolescence

zombie media

electronic-waste

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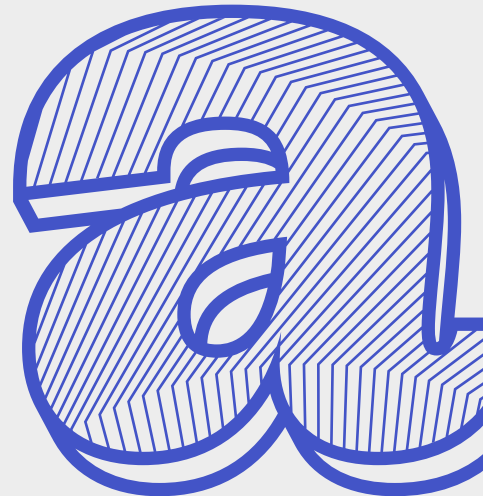
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INTRODUCTION: INQUIRING THE ECO-MATERIAL IMPLICATIONS OF COMPUTING THROUGH DESIGN

Bridging misleading digital metaphors, planned obsolescence, and collaborative design methods with critical (un)making, our contribution further contextualizes the non-western practices of computer repair and appropriation as crucial discourses in the academic field of maintenance studies. Starting from the ubiquitous misleading narrative of the digital cloud, it sheds light on the importance of such practices as foundational practice-based frameworks and case studies that question and inquire, through design, the eco-material implications of computing. Drawing from this exploratory research, which enables us to further contextualize the role of arts and design methodologies in shedding light on our planetary electronic-waste (e-waste) crisis, our article is structured around multiple interviews conducted with designers and artists from Accra (Ghana) and its surroundings. Our contribution is also a proposal to connect computer maintenance with artistic inquiries; with repairing and refurbishing turned into an active critical technical practice (Sengers et al., 2005) that questions, through design, the sociotechnical world we live in.

       Our contribution is composed of four sections. The first one situates it within a broader context from where we critically expand our position. This context is the misleading metaphor and narrative of cloud computing: depicting the internet — and the internet's material/hardware base — as a distant object that we observe from afar. The second section debunks this cloud metaphor in order to map and address planned obsolescence as one of the underlying logics behind e-waste. After introducing the term, it connects these phenomena and economic incentives

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to the planetary circulation of e-waste, as well as to the landfill of Agbogbloshie, Ghana. Our third section contextualizes the landfill as an active urban mine where workers are on site to both repair and dismantle computers, zooming in at the level of our first case study: the Agbogbloshie Makerspace Platform (AMP). This project uses collaborative design methods to support and empower the Agbogbloshie community of computer *remaking* and *unmaking* workers. Finally, our contribution investigates Akwasi Bediako Afrane's artistic practice of computer refurbishing and assemblage. By exploring the making of his 'TRONS' (Afrane, 2022), we explore how computing and design can be used as tools and platforms for activating collective awareness, speculation, and change. In the context of our Capitalocenic (Moore, 2015) era, these case studies enable us to shed light on the potential of arts and design methodologies to critically tackle and question the planetary-waste condition in which we live; as well as recontextualize the history and emergence of new media as explicitly analog and material.

FROM THE MISLEADING CLOUD METAPHOR TO THE INTERNET'S ENVIRONMENTALLY SITUATED PRACTICES

> "The word 'cloud' speaks to the way we imagine data in the virtual economy travelling instantaneously through the air or 'skyway'—here in California one moment, there in Japan the next." (Hu, 2016, p. xvii)

Our contribution originates, first, from the seminal metaphor of the internet *cloud*. The cloud is a technical model that characterizes, at its core, a set of computational resources one can access remotely via the internet (Ensmenger, 2018). In addition to this metaphor being technical, it is political (Winner, 1980) and normative: as an apparatus (Agamben, 2009) imposing on us the belief that the internet is a vaporous object we observe from afar, disconnected from its material layer and physical site of execution. This normative and *opaque* characteristic of the model is explicit when we investigate the communication campaigns produced by major internet corporations and cloud retailers. A striking example here is the case of an advertisement produced by Salesforce Inc., a leading company operating in the field. Published in major media outlets such as *The Economist*, *Business Week*, or *The Wall Street Journal*, the communication describes cloud computing as the following: "no software, no hardware, just success" (Figure 1). The intentional use of these words makes tangible a broader corporate desire shared amongst internet key players: oversimplify and obfuscate the way our internet data transmission processes operate in order to reinforce their position and, ultimately, gain control of our data.

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Figure 4: Advertisement for Salesforce.com, a cloud provider. This figure illustrates how our opaque narratives of the internet cloud are developed by internet corporations. Source: http://morris-creative-branding.com/ads-cloud-computing

This over-simplification of the internet megastructure is also explicit when we look at the Open Systems Interconnection model (OSI model), the standard that characterizes data transmission processes as a succession of layers ranging from the internet (Application layer) to the hardware (Physical layer) (Figure 2). We posit here that this schema is incomplete and, likewise the cloud metaphor, misleading, as it omits two core intertwined layers of the internet that are foundational in order to help us further understand the materiality of our digital interactions and infrastructure. The first aspect it omits is what we could refer

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to as the human layer: the complex network and infrastructure of human actors mining, building, moderating, operating, and recycling the internet. This ranges, in a non-extensive way, from miners, printed circuit boards (PCB) factory workers, designers, engineers, moderators, users, repairers, and dismantlers. Drawing from Bruno Latour's analysis in which the more technology succeeds, the more opaque it becomes, the second aspect of this 'blackboxing' (Latour, 1999) model deals with the geological nature of the internet: explicit when we investigate the infrastructure's stages of mining and recycling. This geological layer connects to our computer's raw matter: ranging from silicon (transistors) to copper (wires) or aluminum (heat fans).

Figure 2: The Open Systems Interconnection model. Like the obfuscating cloud metaphor, we argue here that this text-books' model is incomplete because it omits both the human and the geological layers of the internet. Source: Blackmoreops. https://www.blackmoreops.com/2016/05/05/osi-layers/

Layer	Function	Example
Application (7)	Services that are used with end user applications	SMPT
Presentation (6)	Formats the data so that it can be viewed by the user Encrypt and decrypt	JPG, GIF, HTTPS, SSL, TLS
Session (5)	Establishes/ends connections between two hosts	NetBIOS, PPTP
Transport (4)	Responsible for the transport protocol and error handling	TCP, UDP
Network (3)	Reads the IP address from the packet	Routers, Layer 3 Switches
Data Link (2)	Reads the Mac address from the data packet	Switches
Physical (1)	Send data onto the physical wire	Hubs, NICS, Cable

FROM PLANNED OBSOLESCENCE TO NEW MEDIA AND THE AGBOGBLOSHIE ELECTRONIC WASTE LANDFILL

"The sedimentary layers of waste consist not only of circuit boards and copper wires, material flows and global economies, but also of technological imaginings, progress narratives, and material temporalities."
(Gabrys, 2013, p. 4)

Planned obsolescence, the initial sociotechnical framework contextualizing this article, is one of the structuring concepts of our capitalistic societies and culture. It is, following John Scanlan, inherent to time: providing the

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network "within which things become corruptible and useless" (2005, p. 37). Drawing moreover from design historians Ellen Lupton and J. A. Miller (1992), planned obsolescence is a fundamental component of the production cycle of our capitalistic sociotechnical cultures, as by shortening the natural lifespan of our objects and commodities, it regulates markets before they reach saturation. At the root of planned obsolescence and e-waste sits another narrative disembodying our technologies from their human and material conditions: *new media*. New media, structuring the Western socio-technical landscape,[1] is driven by technological progress and change: where a constant process of innovation and invention is conducted in search of better technologies to implement—and *discard*. The lifespan of our digital culture hardwares—such as computers we use to operate and connect to the internet—is then controlled by a specific logic: the short-term forthcoming obsolescence (Hertz & Parikka, 2012). This trashed (Sterne, 2007) sociotechnical—human, material, and technological—condition of our digital culture—with new media always becoming old (Hertz & Parikka, 2012)—is both embedded in our consuming behaviors as well as within these materialities and design. A blatant example of this *built-in* and engineered planned obsolescence is the case of our computer ports (Figure 3): differing from one computer to another, and therefore requiring us to keep purchasing in order to adapt to the technological change.

1 Socio-technical, a term coined by Emery and Trist (1960), describes systems characterized by a complex interaction between "humans, machines and the environmental aspects of the work system" (Baxter & Sommerville, 2011). In the context of the article, I draw from this definition in order to refer to the human practices, discourses, and beliefs emerging from our Western and Eurocentric technological production and consumption.

Figure 3: Computer ports. This example illustrates the economic injunction that sits behind the idea of new media: planned obsolescence. Source: Wikimedia. https://up-load.wikimedia.org/wikipedia/commons/f/f2/Computer-connector-sockets.jpg

This blackboxing of technology, both harder to repair and structured around planned obsolescence, is inherently linked to the planetary production, circulation, and crisis of e-waste. Following the Organization for Economic Co-operation and Development (OECD), e-waste is defined as "any appliance using an electric power supply that has reached its end-of-life" (UNEP, DTIE, 2007, as cited in Lundgren, 2012, p. 11). E-waste describes, therefore, in broad terms, discarded electrical or electronic devices; as well as electronics planned for refurbishment, reuse, resale, or recycling. An important characteristic of it is its impli-

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cation for both local and planetary flow of trade (Figure 4): flow that is difficult to quantify primarily due to the grey zones that surround its definition. However, it is estimated that its production is growing by 40 million tons per year, flowing to disadvantaged and historically marginalized areas due to its economic costs: it is ten times cheaper to export to Global South countries than to process in the United States (Lundgren, 2012).
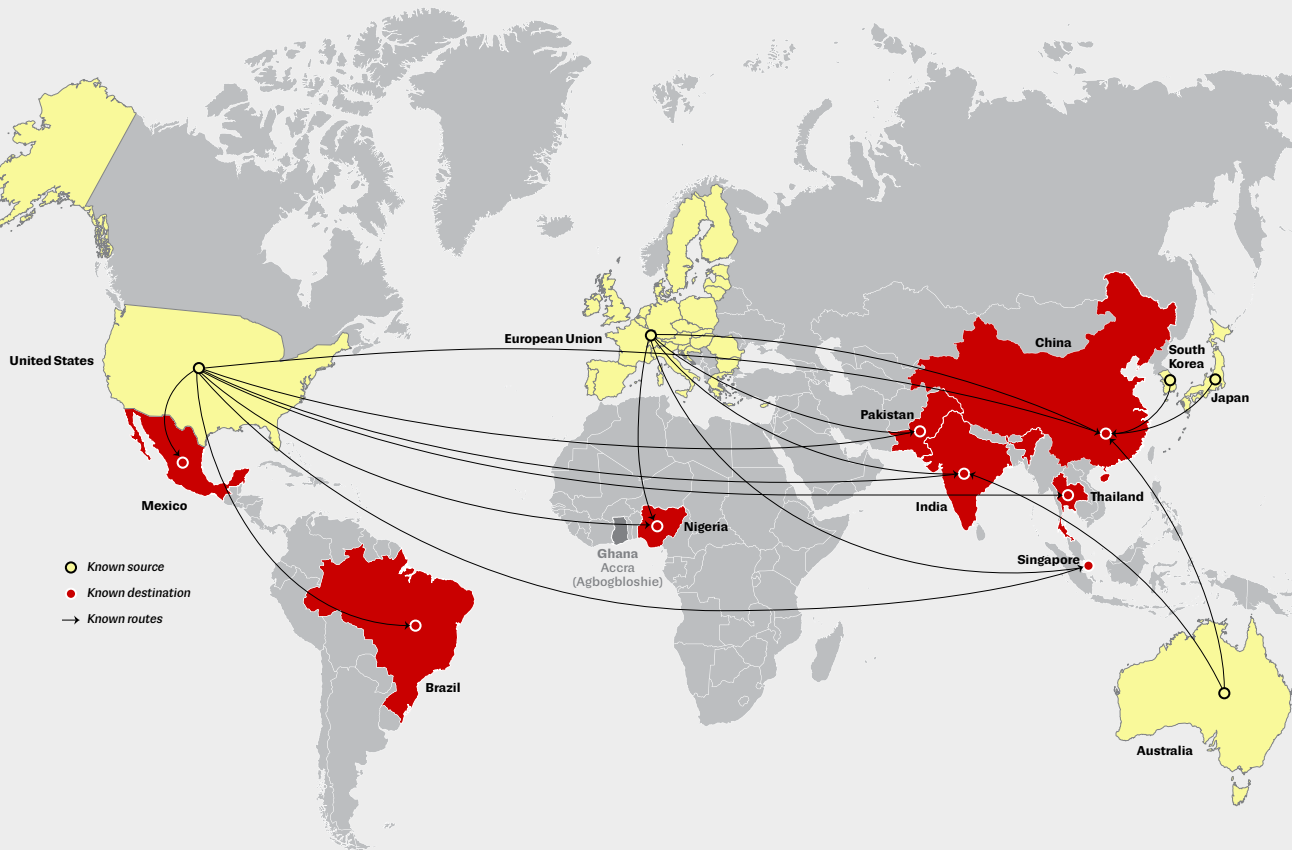
Figure 4: The e-waste planetary flow. The map illustrates the transfer of e-waste from the Global North to the Global South (from where Ghana and Agbogbloshie emerge). Source: Efthymiou et al., 2016 (modified). https://www.mdpi.com/ijerph/ijerph-13-00789/article_deploy/html/images/ijerph-13-00789-g001.png

Behind the black box and narrative of both the cloud and new media sits therefore a complex precarious human and material infrastructure of e-waste processing, repair, and recycling. This infrastructure is tangible when we zoom in at the level of Agbogbloshie (Accra), where the waste arrives from the local harbor of Tema. Agbogbloshie is (in)famously referred to by occidental media outlets as the world's biggest computer graveyard (Figure 5). We argue here that this *dying computer* narrative is misleading and problematic, as it wrongly

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Figure 5: *The Atlantic:* 'Inside a Massive Electronics Graveyard'. Western electronic-waste narratives around Agbogbloshie that we aim to deconstruct through this contribution. Other media describing Agbogbloshie as a graveyard include *The New York Times* and *France 24*. Source: Screenshot from *The Atlantic*. https://www.theatlantic.com/technology/archive/2014/12/inside-a-massive-electronics-graveyard/383922/

suggests that waste accumulates in Agbogbloshie (and the Global South) without any processing, repairing, or recycling. In reality, Agbogbloshie is at the heart of a local, national, and transnational economic circuit, with scrap dealers "traveling as far afield as Côte d'Ivoire, Nigeria and Benin to purchase end-of-life equipment for dismantling" (Osseo-Asare & Abbas, 2021, p. 66). This computer graveyard narrative is also refuted by the key role of Agbogbloshie within the local community of computer repairers searching for missing computer components on the landfill during their repairing tasks. In opposition with the western narratives around electronic waste, zooming in at the level of Agbogbloshie makes therefore explicit the re-appropriation and reuse of discarded computers and computer parts: refurbished by Ghanaian repairers and sold back on the local market to both individual users and broader structures, ranging from internet cafes, libraries, and schools (Burrell, 2012).
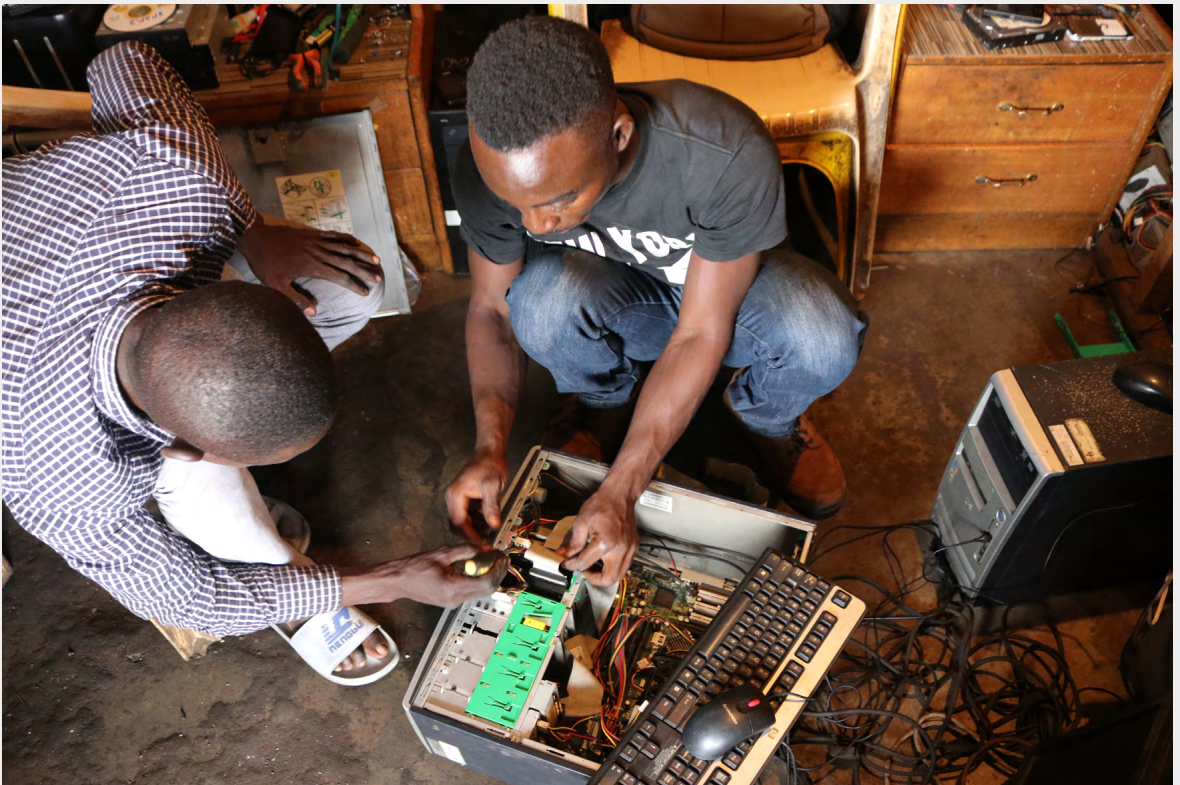
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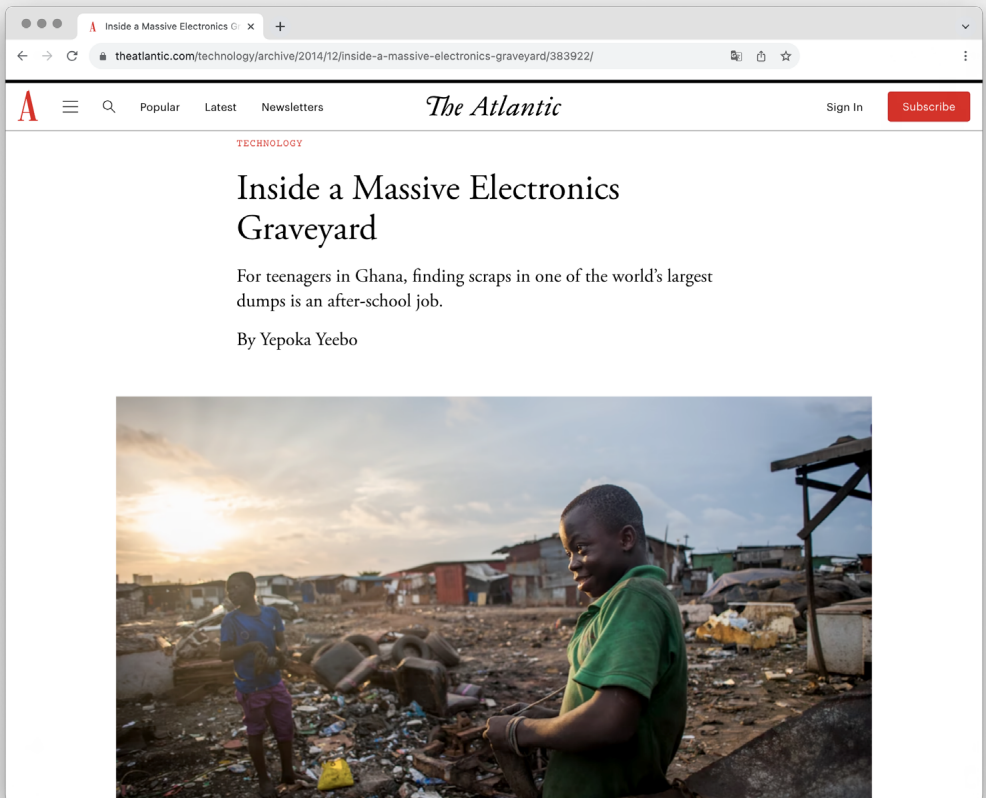
FROM TACIT KNOWLEDGE TO THE AGBOGBLOSHIE MAKERSPACE PLATFORM

"An important point that can be lost… is that the artefacts and the experience is not the work. The actual work and rationale for the method is that it will lead to better futures thinking, better decision-making and strategy, and ultimately, more preferred futures." (Dunagan, 2018, as cited in Potter et al., 2019, p. 42)

Agbogbloshie is therefore the economic district and site of operation of a complex network of computer dismantlers—*unmakers*—and computer repairers—*remakers*: two groups of workers inherently connected inside the Agbogbloshie's e-waste value stream. Dismantlers, on the one hand, are concerned with transforming *trashed* electronic debris into valuable parts. Dismantlers work with computer repairers and scrap dealers who are interested in collecting valuable metal debris ranging from aluminum to copper, steel, and brass. What is judged valuable depends on its potential to be recirculated through the second-hand computer market. Dismantlers work with rudimentary tools—hammers, screwdrivers, tweezers, sol-

Figure 6: Agbogbloshie's computer *repairers* working with rudimentary tools. The image shows the lack of infrastructure and tools; the fieldwork reality from where the AMP reacts. Source: Agbogbloshie Makerspace Platform. Credit: AMP. https://flic.kr/p/X9319q

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dering irons, toothbrushes—in order to dismantle untested components (Figure 6) and store computer parts they identify as potentially suitable for repairers. These untested components, varying from screens to chargers, wires, capacitors, and other Integrated Circuits (ICs) are then bought by computer repairers working both on-site and in Accra in order to be tested and reused as interchangeable parts. Dismantlers and computer repairers share the same characteristics. The majority of them have been trained through apprenticeship and operate with their own know-how: techniques, strategies, and optimizations discovered along their career, enabling them to be more efficient, productive, and profit-driven. The nature of their work is therefore characterized by its tacitness, as well as by a sense of instability and isolation reinforced by the grey zones surrounding the acceptance of the Agbogbloshie landfill, which Ghanaian officials have attempted multiple times to unsuccessfully shut down (Seidu & Kaifie, 2022).[2]

       Instead of the electronic waste terminology, as a term that obfuscates this network of recycling actors and waste workers, we therefore posit, drawing from AMP co-lead designers Osseo-Asare and Abbas, for the reconceptualization of "Waste Electrical and Electronic Equipment (WEEE or e-waste) as Electrical and Electronic Equipment (EEE or 3E): not as waste, but as inter-manipulable assemblages of 3E-materials" (Osseo-Asare & Abbas, 2015, p. 41) from where landfill workers extract profit. This network of repairing (*remaking*) and dismantling (*unmaking*) brings, however, an economical-health dilemma: it is also responsible for the production of very high levels of health-threatening pollutants (Potter et al., 2019). In addition to the lack of universal regulations around labeling toxic materials, this is due to the precarity of their work infrastructures and practices: conducted in closed-space and without the required ventilation or air-cooling infrastructure. By operating without gloves or masks, health impacts and exposures when remaking or unmaking these computers range moreover from ingestion, inhalation, or dermal contact (Perkins et al., 2014). The first cause of this health implication connects to the body of practices emerging from the burning, desoldering, and resoldering of computer components. In this context, these practices are harmful because they lead to the inhalation of highly toxic acid fumes: containing high saturations of lead, cadmium, and mercury (Wittsiepe et al., 2017). These health issues and implications also manifest when dust blowers, glue, and cleaning solvents are in use without proper ventilation nor gloves, leading to direct skin contact with liquid acid and dust inhalation. On a macro level, this is also responsible for a broader environmental contamination impacting, at the level of Agbogbloshie, local communities' schools, houses, and markets through highly polluted air and soil (Figure 7).

       It is from this context that we posit the importance of the Agbogbloshie Makerspace Platform (AMP) initiative, a critical making (Hertz, 2009) and

2   The history of the dismantling attempts is further described in Akese et al. (2022); and 'Crisis in Agbogbloshie, Ghana, Caused by Forced Dismantlement of the Landfill' (2021).

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unmaking (Gaboury, 2018) platform empowering local repairers and dismantlers through open-source collaborative design methods. The AMP shares characteristics with the Western and Eurocentric *fablabs* and *makerspaces*: as an inclusive space where hobbyists and professionals can freely join and use prototyping tools and workpieces. In the context of the AMP, these equipments vary from standardized and robust tools enabling more safety and efficiency—screwdrivers, soldering and circular saw protective glasses, and gloves—to computer-assisted machines like 3D printers and multi-axis CNC (Osseo-Asare & Abbas, 2015). One characteristic of the AMP is its modularity: made with metal and rubber structures and materials that can easily be changed, transported, reconfigured, and reassembled (Figure 8). This creates a context where local communities of dismantlers and repairers can take control over the structure, and redefine the makerspace architecture following their own needs. This modularity and kinetic system are also a core principle of the space's interior architecture: with shelves and working stations that can be added or removed depending on the needed space. Finally, the AMP also aims to be a knowledge-gathering infrastructure: centralizing and materializing from and for the community of dismantlers and repairers the various techniques, resources, and safety measures, making the production and operation of their daily tasks more sustainable.

We argue that Osseo-Asare and Abbas' AMP project successfully addresses, at the scale of Agbogbloshie, some of the key issues of e-waste: offering an infrastructure that can quickly and efficiently benefit the work of discarded computer dismantlers and repairers. The first challenge it successfully addresses is the need for openness and modularity, due to the unstable nature of the site, which can easily be dismantled or displaced by Ghanaian locals. Borrowing from the kiosk culture and architecture (Osseo-Asare & Abbas, 2021) and favoring an open and inclusive infrastructure, the project empowers the local community by being easy to scaffold, occupy, and appropriate.

Another key point of the project is its desire to set foundations for an infrastructure of reproducible knowledge. This is characterized by the gathering of the techniques and personal how-to strategies of dismantlers and repairers of Agbogbloshie, in order to enable them to collectively draw from resources that are commonized and shared. This commoning approach is also reinforced by two main points of the AMP initiative. The first is to federate workers isolated across the landfill through a centralized space (Figure 9), creating the condition for better collective appropriation and spatialization of the landfill (Osseo-Asare & Abbas, 2015). This empowering approach is also structured around the collective brainstorming and production of new tools using the AMP infrastructure, workpieces, and 3D machines, enabling the creation of objects that are more adapted for the dismantlers' and computer repairers' daily tasks. This fosters a design

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↓ **Figure 7**: Agbogbloshie polluted soil and water. The figure illustrates the contamination of the soil surrounding Agbogbloshie, and the crucial need—as tackled by the AMP—for more sustainable working conditions. Source: Agbogbloshie Makerspace Platform. Credit: AMP. https://flic.kr/p/oys9zj

proposal and context that expands in order to provide alternatives for "maker-oriented futures" (Potter et al., 2019, p. 49). Such futures would visualize computer repairers empowered to use the tools and skills of design to create alternative material realities, specific and responsive to their unique conditions.

→ ↗ **Figure 8**: AMP: Making the structure. The figure illustrates the modularity of the AMP structure, which can be transported and reconfigured following the dismantlers' and computer repairers' needs. Source: Agbogbloshie Makerspace Platform. Credit: AMP. https://flic.kr/p/pQ5cHi

→ **Figure 9**: AMP: Re-appropriating the Agbogbloshie's space. The figure shows the AMP federate repairers and dismantlers re-appropriating the space of the landfill. Source: Atlas of the Future. https://atlasofthefuture.org/wp-content/uploads/2018/05/AMP-space-craft-2-same-as-website-homepage-1920x1280.jpg

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## FROM AKWASI BEDIAKO AFRANE'S TRONS TO ZOMBIE-MEDIA ARCHAEOLOGY

> "Media in its various layers embodies memory: not only human memory, but also the memory of things, of objects, of chemicals and of circuits." (Hertz & Parikka, 2012, p. 425)

This empowerment of new realities through design also echoes the work of Akwasi Bediako Afrane, a Ghanaian media artist refurbishing and re-appropriating discarded computers to critique and speculate on our planetary electronic waste wicked (Buchanan, 2001) issue. Afrane refers to his practice as an assemblage-making of computer amputees, or 'TRONS' (Afrane, 2022). Expanding from these words, he aims to explore critically and speculatively the production, circulation, and subversion of our obsolete electronic gadgets, by repurposing them outside of their initial use cases. Forging new material relationships with (and through) these computer debris, his work is moreover concerned with the exploration of what he frames as electronic prosthetics (Afrane, 2022): re-appropriating these *rejects* in order to give them new poetic and non-utilitarian ontological meanings. These anti-machines (Afrane, 2022) serve then as a starting point to question and critique the underlying ideas governing our consuming culture: from planned obsolescence to new media. Where our computers are defined by modernist aesthetics of shininess, seamlessness, and minimalism that obfuscate their human and geological layers, the artist cracks open our computer's black box and turns our electronics into an assemblage of wires, knobs, transistors, light-emitting diodes (LEDS), servo-motors, or printed-circuit boards (PCBS) (Figure 10). Through his practice of subversion, re-appropriation, and insertions into the ideological circuits (Meireles, 1970-1975) of our electronic computers and gadgets, he then exposes the materiality of these devices, powering our sociotechnical condition in alternative ways; in ways that contradict their built-in narratives of opacity and new media.

This sheds light on the political and subversive nature of Afrane's 'TRONS': questioning through alternative configurations of technology the current technology-intertwined life we live in. This desire to deconstruct through critical design (Dunne & Raby, 2013) strategies the dominant narratives around technology is especially explicit in Afrane's will to place in dialogue (and tension) two information mediums and objects, whose materialities are opposed. These are a cathode-ray tube (CRT) television and a virtual reality (VR) headset (Figure 11). By doing so, the artist's approach echoes the definition of 'zombie-media' (Hertz & Parikka, 2012, p. 425). Zombie media, developed as an art method by Garnet Hertz and Jussi Parikka, proposes to use the design of technological assemblages (and in

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→ **Figure 10**: Afrane's 'TRONS'. Interactive sculpture, detail, 2022. The image makes explicit the artist's desire to reinvestigate the materiality of trashed computers for the making of his *non-utilitarian* robots. Akwasi Bediako Afrane, 2022. Source: https://www.gameoftrons.com/

↓ **Figure 11**: Afrane's 'TRONS'. Interactive Sculpture, Virtual Reality headset. The image illustrates the artist's desire to engage inside the same spatio-temporal context with technologies with contradicting materialities. Akwasi Bediako Afrane, 2022. Source: https://www.gameoftrons.com/
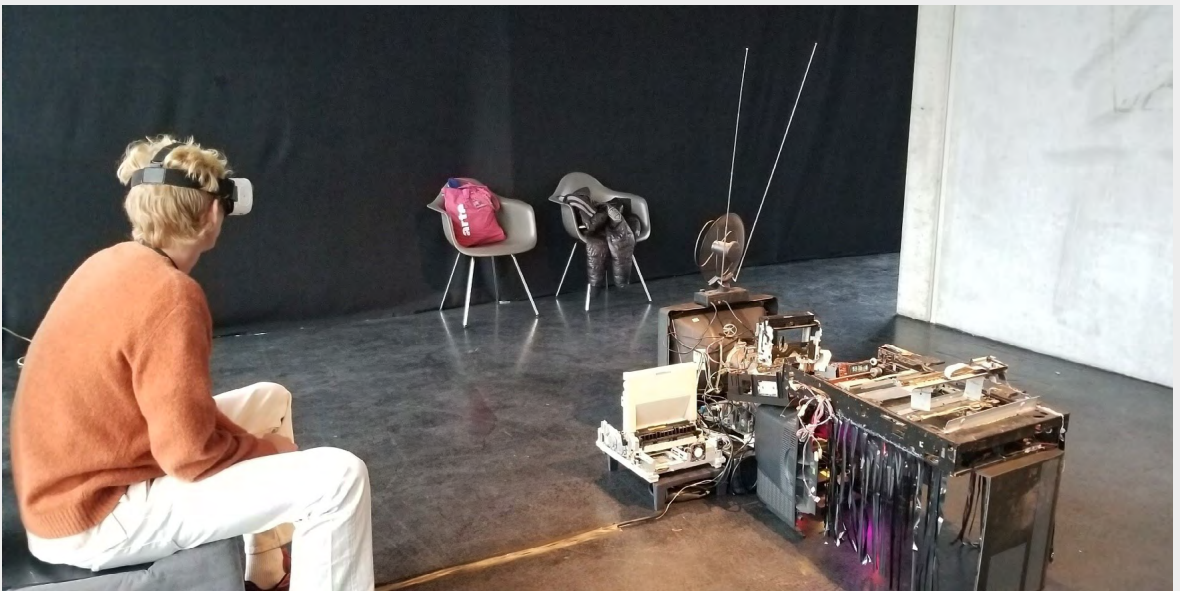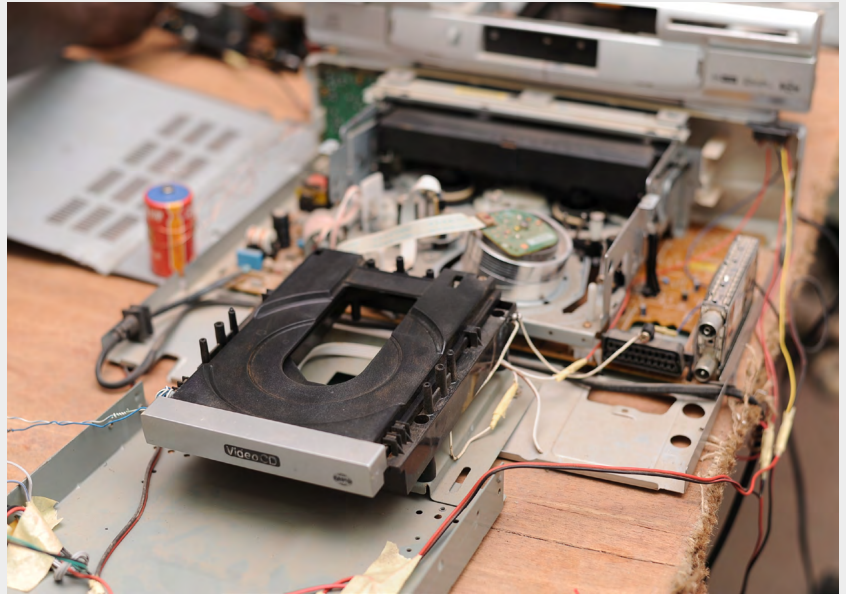
this case: repairing and refurbishing) as a catalyst to deploy a critical perspective on the new-media-ness of technology. Moreover, it proposes to take the counterpoint of the glossy, high-tech, and shiny understanding of technology associated with Silicon Valley's Californian ideology (Barbrook & Cameron, 1996) in order to make visible and repurpose obsolescence (and obsolete energy regimes) inside design fiction contexts. By doing so, zombie media entangles and maps inside the same material context different technological, temporal, or power regimes, resurrecting

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old media and processes into new uses and meanings (Hertz & Parikka, 2012), in order to reframe, from a non-linear perspective, our technology and computing history. Circling back to the artist, explicitly showing here the materiality—and viscerality: tubes, wires, broken cases, antennas—of this CRT television contradicts the seamlessness aesthetics of the VR headset and device. More specifically, it recontextualizes the emergence of the VR *new media* into a complex history (and genealogy) of information technologies whose materiality is explicitly analog and material.

CONCLUSION: E-WASTE AS A CATALYST FOR OUR SOCIOTECHNICAL LITERACIES

In opposition to our ubiquitous dominant discourses around computing and the digital, we have presented through our contribution two case studies gravitating around the electronic and processing site of Agbogbloshie (Ghana). We also situated the importance of shedding light, inside academic maintenance studies debates, on this research through design contexts and initiatives. By doing so, we contextualized these projects as offering the counterpoint of the Western and Eurocentric electronic-waste tropes and dominant narratives.

In the first section, we critically explored the technical and political metaphor of the cloud: a model that obfuscates our data transmission processes. Expanding moreover from the way our digital culture is depicted by key players of the internet, we critically analyzed the normative characteristics of the metaphor: as one of the many examples of how design apparatuses are used to obfuscate the material realities of our technological consumption. In dialogue with the OSI model, we argued that—both from the cloud and from this technical diagram—two crucial layers of the internet and computing are hidden: the human and geological ones. As mentioned earlier, these range from precarious urban mining practices to the burning properties of e-waste metals then sold on the market, and the presence of toxin and chemical waste when dismantling computers.

Shedding light on these two layers enabled us to draw to our contribution's second section, concerned with the production, circulation, and re-appropriation of e-waste. Here, we circled back to the Western and Eurocentric narratives in order to tackle the one of new media: sitting at the core of our planned obsolescence culture. Contextualizing this sociotechnical phenomenon into a planetary intertwinement of e-waste flow, we shed light on the connections between the local and the planetary; between the Western desires and injunctions of new media and the circulation of e-waste in the Global South. From this standpoint, we introduced our research context: the Ghanaian e-waste landfill of Agbogbloshie. We zoomed in at the level of the landfill in order to explore, in critical dialogue with the Western and Eurocentric assumptions around e-waste, how computer debris are recycled

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and injected back into Ghana's computer market.

Building its roots from the landfill, our third section introduced our first research through a design case study: the Agbogbloshie Makerspace Platform (AMP). Drawing from its desire to foster an open and inclusive infrastructure for the landfill's dismantlers and repairers, we explored its role as a catalyst for empowerment. Moreover, studying the AMP enabled us to further explore the potential of collaborative design methods as ways to collectively brainstorm and build alternative realities that are more sustainable and desirable.

Finally, we connected the AMP to Akwasi Bediako Afrane's practice of technological assemblage; or 'TRONS'. Acting here as a prosthesis from where the artist re-appropriates trashed e-waste, we shed light on the critical nature of his interventions: asking through design foundational questions about the non-linear history of our computing culture. Zooming out from Afrane's practice to Hertz and Parikka's zombie media art method, we explored how the critical repatriation of old media inside our intertwined new-media design contexts enables us to critically take the counterpoint of our technological landscape as polished, seamless, and immaterial. Moreover, we shed light on how such practices of e-waste re-appropriation are foundational in recontextualizing the history and emergence of *new media* as explicitly analog and material. In dialogue with western and European technological cultures and behaviors, this contribution is a plea to further shed light on the lifecycle and implications of our trashed (Sterne, 2007) electronic devices. In opposition to the dominant narratives and tropes structuring planned obsolescence, it is a call for a more nuanced understanding of technological materials and waste: as 'inter-manipulable assemblages' (Osseo-Asare & Abbas, 2015) actively shaping our practice-based sociotechnical literacies and inquiries. **D**

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