

Critical Labor History of Generative Models

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Abstract

Our work introduces SIGGRAPH to critical theories of generative models, focusing on socioeconomic relations to research and art. We introduce critical theory through computing’s relationship to commodification and labor and contrast two views of generative models: one as the automation of labor and another examining their role in altering human sociality.

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1 Introduction

SIGGRAPH is host to an accelerating flurry of technical papers on visual—i.e., image, video, and 3D—generative models. Despite many nuanced discussions on improving the results and performance of the diffusion process, we have scarcely engaged the technology’s societal impacts. We initiate this conversation by presenting generative models through a sociotechnical lens, focusing on labor automation and visual art. We offer a whirlwind introduction of the normative foundations of generative models from the *critical theory* lens aimed at a graphics audience. We strive to equip our community with a framework for analyzing our impacts and choosing algorithmic design goals beyond visual quality.

Different philosophical and sociological traditions lead to different normative debates on what makes for a “fair” generative model. We opt for critical theory [Horkheimer 1972]—a multidisciplinary tradition rooted in materialist philosophy that also draws from media studies, sociology and psychology—tracing its lineage up to the emerging field of critical artificial intelligence studies. In choosing it, we are essentially asserting that visual generative models cannot be viewed separately from the surrounding political economy and commodity relations—a natural framing for stupendous investments in graphics chips, simmering cultural anxieties over artistic labor automation, and the proliferation of generated imagery on social media. As graphics researchers, we play a central role in these histories. To understand our impacts, we must think of ourselves within the socioeconomic world-system—a lens at the forefront of critical theory.

We sketch the historical and philosophical context from critical theory (§2), outline two perspectives on visual generative models (§3), and conclude with future technical research directions (§4).

2 Critical Theory of Computing

The materialist tradition postulates that understanding society in history requires framing our analysis not primarily in terms of people’s ideas—as in, e.g., Hegelian idealism—but also in how ideas are rooted in people’s material conditions. Therefore, critical theory examines the effects of the dominant economic system on society. To us relevant critical scholarship focuses on the recent mutation of the global economy due to computing. In one way or another, all such theories examine the societal impacts of automation on labor and of data entering commodity relations [Jarrett 2014; Mejias and Couldry 2024; Morozov 2022; Srnicek 2016; Steinberg et al. 2025; Terranova 2000; Weigel 2025].

Taking an animator’s art as an example, we begin by distinguishing two oftentimes contradictory ways it is valued, as commonly understood in critical theory. An animation’s *use value* is how enjoyable, evocative, provocative, etc., we find it. Its *exchange value* is its economic relation to other commodities, all of which are fungible. Once the animation enters commodity relations, its exchange value comes to the forefront, subsuming its use value. Often credited for kick-starting critical theory, Lukács [1971] linked these commodity dynamics to what he called *reification*. He defines it as the tendency to attribute to objects and institutions properties inherent to the social relations behind them, isolating them from the social context. Reification of commodities such as art is called *commodity fetishism*, where “fetish”—referring to religious fetish sculptures—insinuates that the commodified object has a power of its own and over us, despite being an artifact created by people. Thus, we can think of an animation as an object worth a certain amount of currency, with said value stemming from its, e.g., length or detailedness, or perhaps the celebrity or prestige attached to, or the novelty and exclusivity of the technology that produced it; or we can *defetishize* it and think about the education, labor conditions and desire to connect through art that are behind the object of the animation. Commodification of art into data will help us understand generative models which aim to automate its production (§3).

Labor has an analytically privileged place: its value stems from transforming material (and the immaterial) into commodities and goes into determining their values. Labor value has a lower limit based on humans’ sustenance needs, what Smith [1776] called the “common humanity”. To reduce labor costs below what the common humanity dictates requires (computerized) automation. This view of computing originates in Smithian economics as interpreted by Babbage [1832]. He was inspired to design the first computers by de Prony’s method for computing logarithm tables [1824], who envisioned a factory line where few trained mathematicians hand



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out menial tasks to non-mathematician, i.e., *deskilled*, workers. Babbage's *labor theory of the machine* asserts that automation stems from the division of labor: much like steam engines automate sufficiently atomized physical tasks, computers will do the same for mental ones. Reducing animation labor costs eventually necessitates computer graphics. Once a machine can automate animation it becomes fixed capital to be owned privately, and humans who now need only know how to operate it become deskilled. Critical theory reminds us that automated animation exists only due to the dead labor of researchers and artists, invisibilized by the reification of the training data, the models, and their outputs.

While technologies shape our social life, it is important to remember that it is social conditions that lead to automation in the first place [MacKenzie 1984; Winner 1980]. Automation is inseparable from the social relations between those introducing machinery to a workplace and the workers themselves. As MacKenzie [1984] points out, workers are not passive observers, but active agents within the history of technology, going back to the collective action of *machine breaking* in 19th century England. In response, automation has been used for incursions against labor: Winner [1980] gives the example of iron molding machines which “actually produced inferior castings at a higher cost than the earlier process”, but were nonetheless introduced to weaken organized labor [MacKenzie 1984].

3 Critical Theories of Generative Models

In one view generative models fit squarely into the history of mental labor automation via computers. Pasquinelli [2023] traces a critical genealogy of artificial intelligence (AI) in his *labor theory of AI*, building on Babbage's analysis. He claims that AI represents dead labor turned fixed capital: “AI is [...] a systematic mechanisation and capitalisation of collective knowledge into new apparatuses, into the datasets, algorithms, and statistical models”. Thus, SIGGRAPH artists discussing AI automation via their dead labor [Dober et al. 2025] are a resurgence of the 19th century discourse on the *Machine Question* of the effects of automation on workers, including deskilling and unemployment [Pasquinelli 2019]. Muldoon et al. [2024] dereify models to expose the dead labor within via ethnographies of workers. Besides the mundanity of machine learning specialists meeting objectives aligned with profit incentives and the exploitation of data annotators, they also interview an artist coalition demanding their work not be used to clone their abilities unless “subject to the explicit consent of [...] artists” for all future purposes. Here too automation converts atomized worker capacities into capacities of fixed capital of generative models: SIGGRAPH papers on “style transfer” unwittingly participate in turning art into the commodity of data, into fixed capital, all to deskill artists whose styles they presumably enjoy. This quote also exemplifies the need for consent mechanisms in models, both to protect against “artistic forgery” via style transfer [Jiang et al. 2023], as well as against SIGGRAPH works on generative DeepFake imagery, often used to make non-consensual explicit imagery [Umbach et al. 2025].

Recently, Dodik and Weigel [2026] extend this work, supplementing labor automation with the automation of human sociality, as argued through an interpretative textual analysis of primary sources. They introduce the concept *social doing*, the effort we put into building social ties with other humans, e.g., by making art. In

addition to automating, e.g., mathematical capacities, generative models also automate the manufacture of the commodity form of social doing. Visual art reduced to the commodity of digital *content*, a social kind of data, had to exist for visual generative models to exist, and the models' outputs are now more content devoid of living social doing. In their view, the atomization and fungibility of the commodity form of *data imbued with social doing* leads to automated machines which produce more of the same commodity. Meanwhile, the fetishism of the models' outputs detaches us from people who put their art online wanting to connect with others, from social doing now alienated into the model. Private ownership eliminates levers of democratic control over machines that interject into our social fabric. They distinguish between *substitutive* automation that includes 3D girlfriend avatars animated via SIGGRAPH techniques and automated social media “content farms” made efficient by SIGGRAPH, from *mediative* automation integrated into social media and artists' workflows.

4 Conclusion

Dodik and Weigel [2026] emphasize the ability of generative models to liberate, given correct policies and algorithmic decisions. Importantly, policies are intertwined with technology: in their current iteration, generative algorithms reify and obscure the dead labor and social doing and thus make it impossible to respect and reward artists. As seen in the example of voice actors of Muldoon et al. [2024], it is not enough to acquire consent to accumulate training data: instead, research design goals must shift to include making models with consent mechanisms for downstream uses. Moreover, an open research opportunity is to create generative models that build democratic principles into their very architectures.

Beyond research, labor relations remain central to the unfolding of automation (§2). Much like during the 19th century, these dynamics are echoing again in the context of generative models, with harms to artists ranging from economic to psychological [Jiang et al. 2023], in turn leading to resistance, both legal and via labor organizing [Halperin and Rosner 2025; Jiang et al. 2023; May et al. 2026]. Ultimately, dereifying automation allows us to see the social relations behind the automation that decide whether generative models will empowering artistic expression or stifle worker rights.

We have here outlined only one particular line of thought in an intentionally high-level and broad overview. In the future, these theoretical foundations could cross-pollinate with SIGGRAPH works on the environment and minoritized identities [Dodik et al. 2022; Kim et al. 2022; Yu et al. 2025]. The history of computer graphics is built on technologies meant to connect people through art, architecture, storytelling, and human-centered techniques. As a community, we must strive for design principles for generative models that foster that heritage. Critical theory offers guidelines for doing precisely that.

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