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Messages and values in the age of machine learning: From postcards to social media

If Stanisław Pietraszko were to update his essay "Messages and values" today, would he write about social media instead of postcards?

Superficially, the analogy between postcards and social media seems unavoidable. After all, Facebook, Twitter, Instagram, TikTok, and other social media transmit short messages of text, images, and/or videos characterized by the same feature that Pietraszko noticed distinguishes postcards from letters: "the public availability of the verbal text" (and other content).[1] One can assume, then, that Pietraszko and other scholars of the "axiosemiotics" of the postcard such as Zdzisław Wąsik[2] would today also wish to discuss social media forms whose "excessive" and "redundant" performativity (to use Pietraszko's terms) make them objects not just of information but also, and often primarily, of culture. After all, the visual "filters" that users frequently apply to their Instagram or TikTok posts are perfect examples of such excess or redundancy. There is almost no informational and only cultural value, for instance, in making oneself look like a cat.

Yet one doubts that Pietraszko would have been content with just a superficial comparison of postcards to social media. His theoretical analysis was systemic in its aims, focusing on postcards to formulate a general relation between "messages and values" based on the difference between the semiotic function of information and the axiological values of culture. One surmises that today Pietraszko would want to pursue the same kind of systemic analysis by looking deeper into the systems of information and culture behind social media—a level of analysis, however, that poses challenges to his axiosemiotic approach.

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[1] S. Pietraszko, "Messages and values," transl. T. Anessi, *Prace Kulturoznawcze* 26, 2022, no. 4, p. 114.

[2] Z. Wąsik, "On the axiosemiotics of postcards," [in:] *Signs of Humanity / L'homme et Ses Signes*, eds. G. Deledalle, M. Balat, J. Deledalle-Rhodes, Berlin–Boston 1992, pp. 1693–1698, https://doi.org/10.1515/9783110854572-206 (accessed: 13 January 2023).

What sets social media apart from postcards is that in most cases its circulation and reception is steered algorithmically.[3] Machine-learning algorithms process vast pools of user communications to find patterns that can be used cybernetically (in the word's original, etymological sense of *steering*) to search, filter, classify, navigate, and promote messages. The goal is to optimize user engagement and increase monetization (thus aligning cybernetic steering with what Jürgen Habermas called the ultimate "steering media" of money and power).[4] Specifically, the machine learning behind algorithmic steering operates through "deep learning" neural networks trained on large masses of inputs ("big data") by means of "hidden layers" of artificial neuron nodes organized in sequences of increasing abstraction in one direction and iterative feedback for "parameters" ("weights" and "biases" selectively favoring some input features) in the other direction (e.g., through "back propagation").[5] Such neural networks model millions and more of textual "dimensions" in non-intuitive, statistical "latent" spaces of "reduced dimensionality" to discover patterns and correspondences.[6] Outputs take the form of classifications (e.g., decisions about which messages are related to a desired type of message) or even of newly generated texts and images (composited from probabilistically related features).

Here, it is not crucial to attend to the technical details except to note the importance in deep learning systems of what may be called *invisibles* and *unknowables*—for example, missing or inadequate documentation of training datasets, "hidden layers," "latent" semantic spaces, and "priors" (assumptions about the inputs or expected outputs that establish the initial statistical settings of the system).[7] These *invisibles* and *unknowables* characterize the way today's machine

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[3] For the Meta company's use of machine learning algorithms, for example, see C.-J. Wu, D. Brooks, K. Chen, D. Chen, S. Choudhury, M. Dukhan, K. Hazelwood, E. Isaac, Y. Jia, B. Jia, T. Leyvand, H. Lu, Y. Lu, L. Quao, B. Reagen, K. Spisak, F. Sun, A. Tulloch, P. Vajda, X. Wang, Y. Wang, B. Wasti, Y. Wu, R. Xian. S. Yoo, P. Zhang, "Machine learning at Facebook: Understanding inference at the edge" [conference paper], 2019 IEEE International Symposium on High Performance Computer Architecture (HPCA), Washington, DC 2019, 16–20 February 2016, pp. 331–344, https://doi.org/10.1109/HPCA.2019.00048 (accessed: 13 January 2023).

[4] On Habermas, steering media, and social media, see Ch. Fuchs, "Social media and the public sphere," *TripleC: Communication, Capitalism & Critique* 12, 2014, no. 1, pp. 57–101, https://doi.org/10.31269/triplec.v12i1.552 (accessed: 13 January 2023).

[5] For an introduction to neural networks, see Ch. Nicholson, *A Beginner's Guide to Neural Networks and Deep Learning*, Pathmind, 2020, http://wiki.pathmind.com/neural-network (accessed: 13 January 2023).

[6] For an introduction to latent semantic and reduced dimensionality analysis, now conducted through computational neural networks, see T.K Landauer, P.W. Foltz, D. Laham, "An introduction to latent semantic analysis," *Discourse Processes* 25, 1998, nos. 2–3, pp. 259–84, https://doi.org/10.1080/01638539809545028 (accessed: 13 January 2023).

[7] To get a sense of how difficult it is to account for what is in the training datasets behind the large language models such as GPT-3 generated by neural networks, see A.D. Thompson, "What's in

learning participates in the contemporary trend away from understandable statistics toward purely predictive (but not logically comprehensible) probabilistic models. This shift to what has been called an "instrumentalist culture of prediction" or "data positivism"[8] challenges Pietraszko's approach because it creates an axiosemiotic space in which it is impossible to draw the demarcation so important to Pietraszko. That is the demarcation between the *axio* and the *semiotic*, the domain of cultural values, on the one hand, and the domain of communicative or informational messages, on the other hand. "Culture," Pietraszko asserts, "[…] is neither communication nor information."[9]

But this proposition—especially in what may be called its strong form implying also its commutative inverse: *neither communication nor information is culture*—is now questionable because in the machine-learning age neither communication nor information can be understood instrumentally in a twentieth-century functionalist way such that "understanding" and "instrumentality" are simply joined as part of the same function. The understanding of information splits apart from the instrumental effect of information so that, for example, some of the most apparently senseless memes, emoticons, and other textual or image phenomena in social media are also the most virally instrumental in their positive or negative reinforcement of that which is "trending." While the algorithms that steer social media are *nothing but instrumentalist* (predictive in their modeling without any care for why they produce good results), in other words, such instrumentalism *cannot be said to coincide with the semiotic*. All the *invisibles* and *unthinkables* in such systems hollow out the semiosis of instrumentalist information so that information is no longer fully understandable as "messages" but instead as: ¯_(ツ)_/¯. For mass audiences, social media is thus instrumental without anyone necessarily understanding the non- or asemiotic features that algorithms discover to be significant in making a message effective. And for scholars, an entirely new field of computational "interpretability" and "explainability" studies has arisen to address the asemiotic gap between the logic and the functioning of machine learning.[10] Equally important, a whole area of sociopolitical critique has developed around the way the illegible *invisibles* and asemiotic *unknowables* of machine

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my AI?," Life Architect, March 2022, https://lifearchitect.ai/whats-in-my-ai/ (accessed: 13 January 2023). On priors, see Wikipedia, "Prior probability," [entry in:] Wikipedia [EN], https://en.wikipedia.org/w/index.php?title=Prior_probability&oldid=1132069288 (accessed: 7 January 2023).

   [8] See M.L. Jones, "How we became instrumentalists (again): Data positivism since World War II," *Historical Studies in the Natural Sciences* 48, 2018, no. 5, pp. 673–684, https://doi.org/10.1525/hsns.2018.48.5.673 (accessed: 13 January 2023). For the phrase "instrumentalist culture of prediction," see p. 674.

   [9] S. Pietraszko, "Messages and values," p. 109.

   [10] See, for example, Y. Zhang, P. Tiňo, A. Leonardis, K. Tang, "A survey on neural network interpretability," *IEEE Transactions on Emerging Topics in Computational Intelligence* 5, 2021, no. 5, pp. 726–742, https://doi.org/10.1109/TETCI.2021.3100641(accessed: 13 January 2023) and D. Berry,

learning—all that which is inadequately documented, deep, hidden, latent, and "prior" (or prejudicial)—create "algorithmic bias."[11]

In short, interpretability/explainability studies and the critique of algorithmic bias attest to the fact that in the age of algorithms the semiology of messages can no longer be demarcated from the axiology of values (including that of irrational biases) because there is a "black box," like a redaction ▄▄▄▄▄▄▄ in a censored document, covering over the crux in the axiosemiotic system where a line separating the instrumental from the cultural might be marked. Without the ability to draw that line, we face a problematic *continuum* or *gradient* of messages and values that cannot confidently be differentiated or even structured into hierarchies of overlapping primary versus secondary purposes, denotative versus connotative significances, etc.[12]

"Culture […] is neither communication nor information," Pietraszko wished to believe. But for those working in data science now, the challenge is that communication and information *are* saturated by cultural values that cannot be partitioned off. Reciprocally, for those working in cultural studies, the challenge is that cultural values increasingly *are* fused to the instrumental functions of communication and information (as when a "like" in social media is exploited by the system to promote an advertisement). Instrumental functions cannot be compartmentalized from values because in the final analysis the very concept of instrumentality or functionality (and its underlying logics of cause and effect) are changing. Functionalism now incorporates probabilistic operations of predictive modeling that—as technology companies like to say—"just work,"[13] but work in semiotically non-understandable ways that perhaps most resemble how culture works.

"The explainability turn," Stunlaw, 17 December 2019, http://stunlaw.blogspot.com/2020/01/the-explainability-turn.html (accessed: 13 January 2023).

[11] See N. Kordzadeh, M. Ghasemaghaei, "Algorithmic bias: Review, synthesis, and future research directions," *European Journal of Information Systems* 31, 2022, no. 3, pp. 388–409, https://doi.org/10.1080/0960085X.2021.1927212 (accessed: 13 January 2023).

[12] Even when cultural values and communicative functions overlap, it was important for Pietraszko that a demarcation can still be drawn so that the two domains can be separated into "primary" and "secondary"—e.g., as when he writes: "This is the primary function that defines the essence of the message, and thus of the newspaper as a message, regardless of whether the object that performs it has any other functions, in this case qualifying as secondary functions." (S. Pietraszko, "Messages and values," p. 104).

[13] E.g. S, Jobs: "everything happens automatically and there's nothing new to learn. It's [sic] just all works. It just works." Qted in: A. Dayaratna, "Quotes from Apple CEO Steve Jobs on iCloud and device synchronization at 2011 WWDC," Cloud Computing Today, 15 June 2011, https://cloud-computing-today.com/2011/06/15/apple-ceo-steve-jobs-quotes-on-icloud-at-wwdc/ (accessed: 13 January 2023).

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