INTERNATIONAL LEXICON OF AESTHETICS

Spring 2019 Edition, ISSN 2611-5166, ISBN 9788857559926, DOI 10.7413/18258630048

ALGORITHM

By Emanuele Arielli

(First published May 31, 2019)

It. *Algoritmo*; Fr. *Algorithme*; Germ. *Algorithmus*; Span. *Algoritmo*. The word stems from the medieval Latin *algorithmus* or *algorismus*, which is derived from the name of the Arab mathematician Muhammad ibn Musa al-Khwarizmi (Ninth century AD), a native of the Khwarazm region in Central Asia. In the Middle Ages the term designated all procedures for numerical calculation using Arabic numerals. In today's use, an algorithm is a well-defined and finite set of steps to solve a problem or class of problems. In this form, problem solving consists of the transformation of a specific input, which represents a starting state, into a specific output, the end state. Algorithms are implemented in the execution of computer programs, but they can also be formulated as systems of rules in natural language (Christian, Griffith 2016). The concept of algorithms is associated with the idea of automatization and the transfer of control to external and mechanical procedures. Concerning the relationship with aesthetics and the arts, algorithms have been used as tools in the creative process and for the generation of artworks. In recent times, algorithms have been implemented in the observation and analysis of individual aesthetic choices and in the suggestion and evaluation systems employed in all contemporary digital platforms. Consumption of cultural and aesthetic products is therefore increasingly mediated and regulated by software and algorithms that track human behavior. This constitutes the core of recent debates about the relationship between human activity, digitalization, and artificial intelligence.

ALGORITHMIC AND RULE-BASED CREATION

The experiments in the 1960s in the emerging computer and digital arts can be considered one of the first use of algorithms in the aesthetic domain. In 1965, exhibitions like *Generative Computergrafik* (Stuttgart) and *Computer-Generated Pictures* (New York) showed works by artists that consisted of digital drawings based on mathematical functions (see entry on "Computer Art"). During the 1970s and the 1980s, artists increasingly experimented with computerized imaging techniques, interactive digital works, mechanical

generation of objects and texts. Finally, with the advent of the World Wide Web in the 1990s these experimentations fell under the broader domain of "Net art".

The forerunner of computer algorithms in art can be found in the tradition of rule-guided art dating back to the early Dadaist experiments at the beginning of the twentieth century and, after the war, to the Fluxus performances and the work of conceptual artists. "Instructional art" and rule-based works were inspired by the idea of a procedure in which control is transferred to the automation of previously established rules. The instructional element is based on procedures and formal instructions that generate a result in a number of finite steps. As a famous example, the instructions of a Sol Lewitt wall drawing could basically considered an algorithm for generating a mural painting. ("The idea becomes the machine that makes the art", Lewitt 1967.).

ALGORITHM, TASTE, AND AESTHETIC CHOICE

Today, the relationship between algorithmic analysis of information and aesthetics goes beyond avant-garde experiments, and instead concerns the more general issue of the role of artificial intelligence in human cultural processes. Not only is artificial intelligence progressively used in the production of video, music, design, architecture (Manovich 2018), but "intelligent" algorithms play an increasingly pervasive role in the dissemination of cultural products themselves through thought suggestion systems that advise us about what we should watch, buy, listen to.

Externalization and *automation* are two principal characteristics of this development. It is not only the case that data and knowledge are increasingly located in external memories, but also that the use of algorithms in tracking human aesthetic choice and influencing it through suggestion allows us to think that taste formation itself happens to a greater extent in external systems. From this perspective, algorithms and digital platforms can be seen as tools of introspection helping us understand "what we like", even though it should not be forgotten that these systems are not meant to describe our aesthetic preferences passively. Suggestion mechanisms follow opaque rules that are aimed at increasing consumption and engagement, not necessarily delivering a true picture of our profile as aesthetic consumers.

In music consumption, for example, platforms such as Spotify (Morris 2015, Aguiar *et al.* 2018) systematically collect user listening data that can link music content (by means of automated extraction of musicological qualities of songs), online text references (in critical articles or discussion forums), and demographic profiles of consumers to generate tailored suggestions. The profiling of listeners' tastes has in turn led artists to adapt their creativity in producing music that is more likely to succeed according to algorithmic analysis (Gauvin 2018). In a similar way, Netflix has refined its analysis of spectator choices based on his/her choices and behavior (breaks, interruptions, time of the day that the movies are watched, and so on). The collection of this huge amount of data has not only allowed the system to customize its suggestions in an increasingly precise way, but has also enabled the company to become a "system for calculating culture" (Finn 2015) and enables it to predict with effectiveness which type of story, plot, actors and movie setting would make a movie or a series successful. This also led the company to use the data to

independently produce its own media. The influence of this extended and pervasive analysis of consumer tastes on the creative process can be considered as the peak of the process of standardization and economic efficiency that drive today's culture industry. Moreover, as Boris Groys (2016) states, contemporary experimental and avant-garde artists and all "artworld's" members such as critics, curators, or theorists are also subject to the information flux and are not excluded from the digital flow of information and its algorithmic underpinning.

CONTEMPORARY DEBATE AND OPEN QUESTIONS

The fact that our choices in aesthetic consumption has been largely delegated to algorithms has led many to ask whether we are witnessing a loss of control and agency in deciding what to experience and how to shape our own taste. The propensity to open up to certain artworks would be determined by algorithmically driven "nudges" and not simply left to chance or autonomous cultivation of aesthetic competence. A further issue is the problem of the *opacity* of the algorithms: the processes that guide our decision-making are far from transparent, since they are mostly the product of commercially oriented companies. Moreover, algorithms are "cultural machines" (Finn 2017) aimed to make our aesthetic consumption efficient and, at the same time, to mold our preferences in the direction of maximal engagement, while at the same time allowing for the collection of huge amounts of information about users' behavior. In this context, the question arises as to whether algorithmic rationalization leads to a standardization and homogenization of tastes, styles and aesthetic innovations, or, on the contrary, a growing fragmentation of trends in the world of art or consumption should be expected by virtue of an increasingly detailed customization of user preferences.

On a final note, it may also be simplistic to view algorithms in purely negative terms, since this development can also be seen as further progress in the integration and intertwining of technology and humanity (see Simondon 1958). Just as the telescope enhanced our vision, or writing systems made the storage of cultural memory possible, algorithms' effect on creativity, taste, and aesthetic choice also represents a new tool that allow us to widen and enrich our aesthetic experience and consumption choices.

BIBLIOGRAPHY

E. Arielli, *Taste and the Algorithm*, "Studi di Estetica", 46/3 (2018): 77-97.

D. Beer, *The Social Power of Algorithms*, "Information, Communication & Society", 20/1 (2017): 1-13.

D. Berry, *Critical Theory and the Digital*, London, Bloomsbury, 2014.

B. Christian, T. Griffiths, *Algorithms to Live By: The Computer Science of Human Decisions*, New York, Henry Holt & Company, 2016.

N. Eriksson *et al.* (eds.), *Spotify Teardown. Inside the Black Box of Streaming Music*, Cambridge, MIT Press, 2019.

E. Finn, *What Algorithms Want: Imagination in the Age of Computing*, Cambridge, MIT Press, 2017.

H. L. Gauvin, *Drawing listener attention in popular music: Testing five musical features arising from the theory of attention economy*, "Musicae Scientiae", 22/3 (2018): 291-304.

B. Groys, *In the Flow*, New York, Verso, 2016.

R. Heersmink, *Extended Mind and Cognitive Enhancement: Moral Aspects of Cognitive Artifacts*, "Phenomenology and the Cognitive Science", 16 (2017): 17-32.

S. Lewitt, *Paragraphs on Conceptual Art*, "Artforum" (June 1967).

L. Manovich, *AI Aesthetics*, Moscow, Strelka Press, 2018.

K. McDonald *et al.*, *The Netflix Effect: Technology and Entertainment in the 21st Century*, New York, Bloomsbury, 2016.

J. Morris, *Curation by Code: Infomediaries and the Data Mining of Taste*, "European Journal of Cultural Studies", 18/4-5 (2015): 446-463.

R. Prey, *Musica Analytica: The Datafication of Listening*, in R. Nowak, A. Whelan (eds.), *Networked Music Cultures*, London, Palgrave Macmillan, 2016: 31-48.

C. Sandvig, *Corrupt Personalization*, "Social Media Collective", June 26th, 2014, accessed April 12, 2019: https://socialmediacollective.org/2014/06/26/corrupt-personalization/.

G. Simondon, *Du mode d'existence des objets techniques*, Paris, Aubier, 1958.

T. Striphas, *Algorithmic culture*, "European Journal of Cultural Studies", 18/4-5 (2015): 395-412.

T. Vanderbilt, *You May Also Like. Taste in an Age of Endless Choice*, New York, Knopf, 2016.

HOW TO QUOTE THIS ENTRY

E. Arielli, *Algorithm*, "International Lexicon of Aesthetics", Spring 2019 Edition, URL = https://lexicon.mimesisjournals.com/archive/2019/spring/Algorithm.pdf, DOI: 10.7413/18258630048.

Please note that this URL is fixed, since it belongs to *ILAe*'s archived edition. This allows readers to quote a stable document for academic purposes.

This entry also belongs to the second volume of *ILAe*'s printed edition. Each issue of this edition collects *ILAe*'s Spring and the Autumn online editions per year. The proper reference of the printed edition is:

E. Arielli, *Algorithm*, "International Lexicon of Aesthetics", Vol. 2, Milano, Mimesis, 2019.