Interaction, Interactivity, Interactive Art
A Buzzword of New Media Under Scrutiny

"Interactivity" has virtually become a magic word for the promotion of new media (arts) and the information society alike. Nevertheless the significance and the value of the term are more than controversial. The term refers not only to a certain technology; it also stands for social concepts and visions ranging from grassroots democracy all the way to consumer freedom. This imbues the term with its broad-ranging impact, but also contributes to its dilution. At this year's conference of the Ludwig Boltzmann Institute Media.Art.Research experts from different disciplines have been invited to examine the origins and applications of the various concepts of interactivity. It questions the extent to which interactivity should be considered a fundamental concept in the social and technological, cultural and artistic context, or as an outdated buzzword, useful only for the self-promotion of the different fields. This essay will give a short introduction to the history of the term and its application to the various scientific and artistic fields.

Interaction/Interactivity

In general usage the term "interaction" conventionally denoted "mutual or reciprocal action or influence". The 1901 *Dictionary of Philosophy and Psychology* defined interaction as: "The relation between two or more relatively independent things or systems of change which advance, hinder, limit, or otherwise affect one another".[1]
With the institutionalization of sociology in the early 20th century, "interaction" was more and more applied to social and societal processes.[2] A new perspective of processes of interaction opened up with the emergence of cybernetic theories. Norbert Wiener, who coined the term cybernetics in 1947, was primarily interested in analogies between the self-organization of the human organism and technological systems of feedback-control.[3] It was not until the beginning of the 1960s however, that the development of computer science allowed for the idea of real-time interaction between man and computer. In 1960 J.C.R. Licklider's groundbreaking essay laid claim to "foster the development of man-computer symbiosis by analyzing some problems of interaction between man and computing machines."[4] It then took only a few years until the first devices actually enabling real-time interaction between man and computer were built. In 1963, Ivan Sutherland developed *Sketchpad,* a graphical interface that enabled the manipulation of graphics on a display using a light pen. Around 1965, Douglas Engelbart developed the *X-Y position indicator for a display system,* now known as the computer-mouse. With the principal concept of the graphical user interface developed by Sutherland, and Engelbart's mouse replacing the light-pen, basic elements of the human-computer interface were available. From then on, human-computer interaction was established as a highly specialized field within computer science.[5]

Interactive Art

The consideration of social interaction as a possible element of artistic projects arose more or less parallel to its story of success in the social sciences. Initial attempts to involve the public can be traced back to the classical avant-garde, although the breakthrough of these new concepts did not occur until after WWII. Since then, the interrelations of artist, artwork and audience have taken root as a basic theme of artistic practice and art theory. Though works that

actively involve the audience (without using new media technologies) are not commonly called "interactive", but "participatory" or "collaborative", their concepts are an important point of reference for works of new media art based on technical feedback-processes. Technically, however, the history of success of the latter is more closely linked to the ideas of cybernetics. Already in the 1950s, Nicholas Schöffer built his *Cybernetic Spatiodynamic Sculptures*. He was followed in the 1960s by artists like James Seawright and Edward Ihnatowicz. They built devices that would interact with their environment or audience, mostly via light and sound sensors. Yet they did not call their works interactive either. Instead, they were called "cybernetic", "responsive" or "reactive".[6] Though the challenge of implementing computers was already discussed within the realm of cybernetic art, only very few works were actually based on algorithmic processes.[7]

In 1969 a group of artists and scientists set up an installation entitled *Glowflow* at the University of Wisconsin. Inside a dark room, phosphorescent particles were circulating in tubes, illuminated by the visitors through touch-sensitive floor pads (controlled by a computer). It was the flyer accompanying the exhibition that for the first time introduced the term Interactive Art: "Glowflow is not an exhibit in the traditional sense, but a continuous experimentation in interactive art."[8] One of the co-creators of this project was Myron Krueger, who is now regarded as the pioneer of Interactive Art. Rather than focusing on the creation of sculptures or robot-like creatures, he started with the idea of the responsive environment, augmented its sensorial capacities by installing video cameras, elaborated its operative options by using computers as control devices, and extended its reactive capacities by projecting computer graphics.[9]

Nevertheless it was not until the 1990s that "Interactive Art" became the catchword of new media art.

The public recognition of Interactive Art as an innate artistic strategy increased, partly due to its inauguration as a category of the Prix Ars Electronica in 1990. In the accompanying catalogue, Roger F. Malina argues that "in creating the Prize for Interactive Art, the organizers of the Prix Ars Electronica have taken the lead in recognizing the works of artists in a new emerging art form." Though he acknowledges the danger of reducing projects to their technological characteristics, he is still convinced that the new category will not just be temporary, because "the computer will allow the development of new types of artforms that have no direct precedent."[10] However, as more and more artists based their works on technological processes of feedback in the 1990s, the discrepancies between the restricted application of the term "Interactive Art" to computer-based installations enabling man-machine interaction on the one hand, and the various denotations of the term "interaction" itself on the other hand, encompassing various concepts of social as well as generative interactivity, became more and more obvious. This led to critical reflections on the term on the one hand, and to attempts of re-definition on the other, like the "broader definition of interactivity" formulated by the Jury of the Prix Ars Electronica 2004, not requiring "mediation by computer", loosening constraints of "real-time" and allowing for "passive interaction."[11]

The Ludwig Boltzmann Institute Media.Art.Research conference does not search for another definition of what Interactive Art is or might be, but wants to explore whether and why artists, scientists and audiences adhere to the classification, and to investigate the use of the terms "Interaction", "Interactivity" and "Interactive Art" for the analysis of contemporary society and the discussion of artistic projects.

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1   *Dictionary of Philosophy and Psychology,* Vol. I, p. 561 f., Ed. Baldwin, James Mark, London, 1901.
2   Cf. Abels, Heinz: *Einführung in die Soziologie,* Vol. 2, p. 204–206, Wiesbaden, 2004.
3   Cf. Norbert Wiener: *Cybernetics or Control and Communication in the Animal and the Machine,* New York, 1948.
4   Licklider, J. C. R.: "Man-Computer Symbiosis", in: *IRE Transactions on Human Factors in Electronics,* HFE-1, 1960, pp. 4–11.
5   Cf. Myers, Brad. A.: "A Brief History of Human Computer Interaction Technology", in: *ACM interactions,* Vol. 5, no. 2, pp. 44–54, March 1998.
6   See in more detail: Kwastek, Katja: "The Invention of Interactivity", in: Dieter Daniels, Barbara U. Schmidt (eds.): *Artists as Inventors, Inventors as Artists,* pp. 182–195, Ostfildern, 2008.
7   Cf. *Software. Information technology: its new meaning for art,* exhibition catalogue, p. 11, ed. Jack Burnham, New York, 1970.
8   Exhibition flyer. Archive of Myron Krueger.
9   Cf. Cameron, Andy: "Dinner with Myron Or: Rereading Artificial Reality 2: Reflections on Interface and Art". In: *aRt&D: Research and Development in Art,* pp. 42–56, ed. Joke Brouwer et al, V2_NAi Publishers, 2005.
10 Malina, Roger F.: "The Beginning of a New Art Form", in: *Der Prix Ars Electronica. Internationales Kompendium der Computerkünste,* pp. 156–160, here p. 156, 159, ed. Hannes Leopoldseder, Linz 1990.
11 deLahunta, Scott and others: "Interactive Art. Rearview Mirror: 1990–2004", Jury-Statement, in: *Cyberarts 2005, International Compendium Prix Ars Electronica,* p. 102–111, ed. Hannes Leopoldseder, Christine Schöpf, Gerfried Stocker, Ostfildern 2005.

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