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On the Practical and Theoretical Possibility of Exploiting Science Fiction for Urban Planning

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ABSTRACT

In recent years, cities and districts, such as Songdo City in South Korea, King Abdullah Economic City in Saudi Arabia, or Singapore, have been planned, built and rebuilt in adherence to the guiding principle of a "Smart City". Some science fiction scenarios are in parts reminiscent of control systems already implemented in these places. Science fiction therefore offers approaches to urban development policy, for example to visualise the possible effects of uncontrolled technologization of the living environment. But is such a use of science fiction even possible? After all, one of the most essential distinctions in literary and media studies is the differentiation between factual and fictional discourse. For most scholars, the decisive distinguishing feature is on the level of form. Using set theory, I intend to differentiate between them on the level of content. This makes it possible to show the hybrid status of science fiction between fictionality and factuality. It is precisely this seemingly contradictory in-between that makes this genre so attractive and highlights its potential for reality. For example, for urban planning.

KEYWORDS

Urban Planning; Smart Cities; Science Fiction; Media Theory; Set Theory

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Learning from science fiction cities. A project

On behalf of the “Federal Institute for Research on Building, Urban Affairs and Spatial Development” (BBSR), the project “Learning from Science Fiction Cities: Scenarios for Urban Planning” was carried out at the Brandenburg University of Technology (Chairs Urban Management and Applied Media Studies).¹ The aim of the project was to investigate whether insights into the future of cities can be inferred from futuristic city designs. Films, comics, novels and computer games in which cities serve as a central plot element were analysed. The focus was on the hermeneutic elaboration of recurring themes. The relevance of each theme for planning discourses was then examined.

It became apparent over the course of the investigations that technologization of the living environment, which is the subject of many works, is perhaps the most promising theme. The development of machines for various areas of life has an indirect, enormous impact on the organisation of urban space. Examples of this are the films *I, Robot* (2004), in which humanoid robots are used as workers and helpers in all areas of life and the film *Her* (2013), which depicts the loneliness of urban dwellers despite utopian infrastructure conditions. A main focus is on the opportunities and emotional risks of a relationship with (disembodied) artificial intelligences. In addition to utopian visions for the future in the broadest sense, there are dystopian imaginings of the future. Many works feature, for example, the recurring scenario of total technical surveillance of the population and the resulting spatial segregation of population groups (e.g. in the comic series “Hard Boiled” (1990-1992)).²

Examples from (East) Asia show that technological developments have to be taken into account in urban planning. In recent years, cities and districts have been planned, built and rebuilt in adherence to the guiding principle of a “Smart City,”³ such as Songdo City in South Korea,⁴ King Abdullah Economic City in Saudi Arabia,⁵ or Singapore.⁶ Some science fiction scenarios are in parts reminiscent of control systems already implemented in these places. These include central data management by

1 See regarding the documentation of the project I was involved in as a consultant: Carolin Pätsch et al., “Von Science-Fiction-Städten lernen: Szenarien für die Stadtplanung” (Bonn: BBSR, 2015); Moritz Maikämper and Carolin Pätsch, “Exploration and Imagination of City Futures in Science-Fiction,” in *Proceedings of the 20th International Conference on Urban Planning, Regional Development and Information Society*, ed. Manfred Schrenk et al., 2015, 295–300.

2 See concerning *Her* the contribution of Denis Newiak in Anke Steinborn and Denis Newiak, eds., *Urbane Zukünfte im Science-Fiction-Film: Was wir vom Kino für die Stadt von morgen lernen können* (Berlin: Springer, 2020), <https://doi.org/10.1007/978-3-662-61037-4>.

3 Andrew Karvonen, Federico Cugurullo, and Federico Caprotti, eds., *Inside Smart Cities: Place, Politics and Urban Innovation* (New York: Routledge, 2018), <https://doi.org/10.4324/9781351166201>.

4 https://en.wikipedia.org/wiki/Songdo_International_Business_District), accessed September 23, 2020.

5 <https://www.kaec.net/>, accessed September 18, 2020.

6 <https://www.smartnation.sg/>, accessed September 23, 2020.

a private company as well as the utter dependence of urban functionality on the technology used. Science fiction therefore offers approaches to urban development policy, for example to visualise the possible effects of uncontrolled technologization of the living environment.

The hybrid status of science fiction. A distinction

One of the most essential distinctions in literary and media studies is the differentiation between factual and fictional discourse. For most scholars, the decisive distinguishing feature is on the level of form.⁷ By contrast, the distinction between “real” and “not real,” the distinction on the level of content is for them and most literary, film and media scholars secondary. Consequently, the non-literary narration of imagined events is treated as a special case in factual discourse. Traditionally, this has been referred to as fictitious discourse; today, one might sooner use the term fake.

This kind of distinction, however, is accompanied by a crucial problem: a clear classification is not possible, as I would like to show by two examples. In the long history of the Nobel Prize for Literature, for example, there have been several awards to non-fictional works. For instance, the second Nobel Prize for Literature was awarded in 1902 to Theodor Mommsen with special reference to his monumental work, *History of Rome*. The commendation called him “the greatest living master of the art of historical writing.”⁸ Yet the literary Nobel has since also been awarded to Bertrand Russell (in 1950) “in recognition of his varied and significant writings in which he champions humanitarian ideals and freedom of thought”⁹ and to Winston Churchill (in 1953) “for his mastery of historical and biographical description as well as for brilliant oratory in defending exalted human values.”¹⁰ So there are certainly factual texts that meet the criteria for literature in terms of form. They would have to be classified as fictional works according to the scheme referred to above. On the other hand, there are entire genres that present fiction in the same way as facts, e.g. so-called mockumentaries. A mockumentary is a type of film or television show depicting fictional events but presented as a documentary. Maybe the distinction on the level of form isn’t adequate, after all.¹¹

7 See concerning the state of the art distinction: Matías Martínez and Michael Scheffel, *Einführung in die Erzähltheorie* (München: Beck, 2020), 12, <https://doi.org/10.17104/9783406742910>.

8 <https://www.nobelprize.org/prizes/literature/1902/summary/>, accessed September 23, 2020.

9 <https://www.nobelprize.org/prizes/literature/1950/summary/>, accessed September 23, 2020.

10 <https://www.nobelprize.org/prizes/literature/1953/summary/>, accessed September 23, 2020.

11 For further information: Craig Hight, “Mockumentary: A Call to Play,” in *Rethinking Documentary: New Perspectives and Practices*, ed. Austin Thomas and de Jong Wilma (Berkshire: Open University Press, 2008), 204–16.

For the first media theorist of the Western world, Aristotle, the decisive criterion is *not* the linguistic form, but the truth or falsehood of what has been said.¹² I intend to differentiate between factuality, fictionality and fake not only starting from the level of content but based *solely* on the level of content. Nevertheless, the intention is not to pick up from where Aristotle leaves off. That is to say: my premise is not the difference between being and possibility, between “what actually happens” and “what could happen.” Rather, the point of departure shall be the (to this day) prevailing idea of content as a “represented world” in literary, film and media studies discourse. An interesting approach in this respect is formulated by Michael Titzmann, who sees the represented world as being described by a set of ordered propositions.¹³ What Titzmann is suggesting is nothing less than the set theory modelling of represented worlds, which, however, neither he nor anyone else has carried out.

Recently I showed¹⁴ that represented worlds (“ R_x ”) can be modelled as sets (“ $\{\}$ ”) whose elements are ordered pairs (“ (x, y) ”) that symbolise the statements that apply to the represented world. For instance, *Houston, We Have a Problem!* is a 2016 internationally co-produced mockumentary film that claims that Yugoslavia developed a space program in the early 1960s, which was then sold to the John F. Kennedy administration for \$2.5 billion. In the represented world of the film, the two propositions “Yugoslavia developed a space program in the early 1960s” (“ D ”) and “Yugoslavia sold its space program to the USA for 2.5 billion dollars” (“ S ”) are each given the truth value “true” (“1”) and both statements are noted down in the form of an ordered pair:

$$R_H = \{(D, 1), (S, 1)\}.$$

Or generally:¹⁵

$$R_x = \{(x,y) \mid (x,y) \text{ is a statement of the represented world of text } X\}.$$
¹⁶

Since such modelling is possible not only for represented worlds (“ R_x ”) but also—in application contexts—for the “real” world (“ W ”),

12 Aristotle, *Poetics* (Oxford: Oxford University Press, 2013), 28–29 (=1451b), <https://doi.org/10.1093/oseo/instance.00258601>.

13 Michael Titzmann, “Semiotische Aspekte der Literaturwissenschaft,” in *Semiotik. Ein Handbuch zu den zeichentheoretischen Grundlagen von Natur und Kultur* 3, ed. Roland Posner, Klaus Robering, and Thomas A. Sebeok (Berlin: De Gruyter, 2003), 3028–3103, especially 3071.

14 See Peter Klimczak, “Fremde Welten—Eigene Welten. Zur Kategorisierenden Rolle von Abweichungen für Fiktionalität,” *Medienkomparatistik* 2 (2020), 113–137.

15 In order to remain as comprehensible as possible, the mathematical representation has been simplified. For a detailed description see Klimczak 2020.

16 Read: “The represented world of text X [$=R_x$] is the set of all statements [$=\{(x,y)\}$] for which applies: (x,y) is a statement of the represented world of text X .”

$$W = \{(x,y) \mid (x,y) \text{ is a statement of the real world}\},^{17/18}$$

one can determine through simple comparison of the elements of the sets in question whether there is a subset relation between the represented world set and the real world set, thus whether the set that symbolizes the represented world is a subset of the set that symbolizes the real world:

$$R_x \subset W,^{19}$$

$$R_x \not\subset W.^{20}$$

Regarding the example above, it must be stated that the represented world of *Houston, We Have a Problem!* is not a subset of the set symbolizing the real world,

$$R_H \not\subset W,$$

since neither the statement "It is true that Yugoslavia developed a space program in the early 1960s" ("(D, 1)") nor the statement "It is true that Yugoslavia sold its space program to the USA for 2.5 billion dollars" ("(S, 1)") are elements of the set symbolizing the real world. On the contrary, it can be assumed that both the statement "It is false that Yugoslavia developed a space program in the early 1960s" ("(D, 0)") and the statement "It is false that Yugoslavia sold its space program to the USA for 2.5 billion dollars" ("(S, 0)") are elements of the set that symbolizes the real world:

$$W = \{(D, 0), (S, 0), \dots\}.^{21}$$

However, the determination of a subset relation is possible not only in terms of the sets that describe the represented and the real worlds, i.e. the statements within the represented and real worlds, but also with respect to the mere proposition of the represented and real worlds.²² For this purpose, the domains of the sets that symbolize the represented and the real worlds must be determined,

$$\text{Dom } R_x = \{x \mid \text{is a proposition of the represented world of text } X\},^{23}$$

17 Read: "The real world [=W] is the set of all statements [= (x,y)] for which applies: (x,y) is a statement of the real world."

18 At this point, the question arises as to what is meant by statements of the real world. I plead to accept as statements of the real world all statements of the real world which are sufficiently proven. Whether a statement can be considered sufficiently proven depends on whether the derivation of this statement meets certain criteria: consistency, reasoning, method, citation, depth of research, authority and so on. See Klimczak 2020 for a detailed description and discussion.

19 Read: "The represented world of text X is a subset of the real world" or more detailed "The set containing the statements of the represented world of text X is a subset of the set containing the statements of the real world."

20 Read: "The represented world of text X is *not* a subset of the real world" or more detailed "The set containing the statements of the represented world of text X is *not* a subset of the set containing the statements of the real world."

21 It may also be assumed that the set that symbolizes the real world has other elements (statements). This circumstance is explained by "...".

22 As has been seen in the above exposition, "statement" means a "proposition" to which a truth value (true, false) is assigned. For example: "It is false that Yugoslavia developed a space program in the early 60s." A proposition, on the other hand, is a mere description of a matter without determining whether the described matter is true or false.

23 Read: "The domain of the represented world of text X [=Dom R_x] is the set of all propositions [=x] for which applies: x is a proposition of the represented world of text X."

$$\text{Dom } W = \{x \mid \text{is a proposition of the real world}\},^{24}$$

and the subset relation between their domains verified:

$$\text{Dom } R_x \subset \text{Dom } W,^{25}$$

$$\text{Dom } R_x \not\subset \text{Dom } W.^{26}$$

Contrary to the statements, with regard to the propositions of the represented world of *Houston, We Have a Problem!* there is a subset relationship to the set that symbolizes the real world:

$$\text{Dom } R_H \subset \text{Dom } W.$$

Both the proposition "Yugoslavia developed a space program at the beginning of the 1960s" ("D") and the proposition "Yugoslavia sold its space program to the USA for 2.5 billion dollars" ("S") are elements of the sets that symbolize the represented world and the real world:

$$\text{Dom } R_H = \{D, S\},$$

$$\text{Dom } W = \{D, S, \dots\}.$$

Based on such a double determination of the subset relation, that is, both in terms of the sets symbolizing the represented and the real world, as well as the domains of these sets, the represented world can be classified as factual, fictional or fake:

$$(\text{Dom } R_x \subset \text{Dom } W) \wedge (R_x \subset W) \leftrightarrow R_x \text{ is factual,}$$

$$(\text{Dom } R_x \subset \text{Dom } W) \wedge (R_x \not\subset W) \leftrightarrow R_x \text{ is a fake,}$$

$$(\text{Dom } R_x \not\subset \text{Dom } W) \wedge (R_x \not\subset W) \leftrightarrow R_x \text{ is fictional.}$$

In other words: (1) A represented world is thus factual if and only if it contains no proposition that does not occur in the set that symbolizes the real world (so that a subset relation exists between the domains of the represented world set and the real world set) and at the same time all truth values of their propositions match truth values of the set that symbolizes the real world (so that a subset relation exists between the domains of the represented world set and the real world set); (2) A represented world is fake if and only if it contains no proposition (as in the case of factual represented worlds) that does not occur in the set that symbolizes the real world, but at the same time (as opposed to the factual represented world), at least in regard to one proposition, a different truth value exists than in the set that symbolizes the real world (in this case a statement about the represented world no longer agrees with the corresponding statement

24 Read: "The domain of the real world [=W] is the set of all propositions [=x] for which applies: x is a proposition of the real world."

25 Read: "The domain of the represented world of text X is a subset of the domain of the real world" or more detailed "The set containing the propositions of the represented world of text X is a subset of the set containing the propositions of the real world."

26 Read: "The domain of the represented world of text X is *not* a subset of the domain of the real world" or more detailed "The set containing the propositions of the represented world of text X is *not* a subset of the set containing the propositions of the real world."

about the real world, so that there is no subset relation between the represented world set and the real world set); (3) A represented world is fictional if and only if it contains at least one proposition that does not occur in the set that symbolizes the real world (so that there is no subset relation between the domains of the represented world set and the real world set). What truth value is attributed to this proposition is irrelevant, as a subset relation between the represented world set and the real world set is thus automatically impossible.

With this distinction it is actually no problem to classify the oeuvres of Mommsen, Russell and Churchill not as fictional but factual, and mockumentaries—as shown by the example of *Houston, We Have a Problem!*—not as factual but as fake. But does this also solve the problem for science fiction films? Each film is a mere product of its respective time of origin. This also applies to the represented worlds, which are set in the earthly future or on planets far away from the earth. And because all these films are products of a very specific time and a very specific culture, it is also valid that their foreign, represented worlds are examined for analogies to the real world of their respective time of origin.²⁷ The foreign, represented worlds can then be read not only literally, but also figuratively. The degree of explicitness as well as concreteness of the respective references may vary from film to film, but in most cases the analogies to be found to the respective extra-filmic conditions will suffice to neutralize both the temporal and spatial difference:²⁸ The foreign, represented world represents only a mirror image, a distorted image or a desired image of the real extra-filmic world. This leads to the question whether a clear classification with the previously presented model is possible at all. Of course it is, but this depends on the degree of abstraction.

If, for example, one does not abstract from the fact that the represented worlds are situated in the future in relation to the time when the films were made, there are necessarily no correspondences in the real world for all statements (or more precisely: propositions) of the film: everything that happens in the future is necessarily contingent. Accordingly, all the statements in science fiction films (like the existence of sophisticated artificial intelligence) are not elements of the set that represent the real world. And since this applies not only to the statements, but also, and especially, to the proposition, the represented world is to be classified as fictional according to the set-theoretical definitions of fictionality, factuality and fake.

27 See concerning the relationship between the represented and the real world: Peter Klimczak et al., *Filmsemiotik. Eine Einführung in die Analyse audiovisueller Formate* (Marburg: Schüren, 2017), 225–29.

28 See concerning the process of neutralisation and substitution: François Rastier, "Systématique des isotopies," in *Essais de sémiotique poétique*, ed. Algirdas Julius Greimas (Paris: Larousse, 1972), 80–105. See, for an example in the context of the set-theoretical modeling presented here: Klimczak 2020.

But if one neglects the level of temporal situation, the level of the represented characters and any concrete form in the individual film and limits the perspective, specific differences can't be detected between the represented and the real world. In other words: The represented worlds are factual due to the fact that they contain no proposition that does not occur in the set that symbolizes the real world (so that a subset relation exists between the domains of the represented world set and the real world set) and at the same time all truth values of their propositions match truth values of the real world set (so that a subset relation exists between the domains of the represented world set and the real world set).

But it is precisely this seemingly contradictory in-between, this hybrid status of science fiction between fictionality and factuality, that makes this genre so attractive and highlights its potential for reality. For example, for urban planning. Science fiction films potentially equip city planners and future scientists with a rich repertoire of possible solutions for the known and unknown urban questions and gives them the freedom to think "outside the box."

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