Can Artificial Intelligence Know about Beauty? – A Kantian Approach

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Abstract

It is a widely held view that beauty is not a property of objects being independent of human beings. Rather, feelings are supposed to be constitutive of beauty, a view that is prominently defended in Kant's aesthetics. Furthermore, Kant holds that there are no rules of taste. In contrast, artificial intelligence (AI) at the current stage of development is not able to have feelings proper, but is only able to apply rules (algorithms). Hence, beauty poses a great challenge to AI. In this article, I will investigate the question of whether AI can know about beauty. Relying on a distinction between three phenomena – namely, the aesthetic experience, the judgment of taste, and the knowledge that an object is beautiful – I will differentiate three sub-questions: (1) Can AI have aesthetic experience? (2) Can AI make judgments of taste? (3) Can AI know about beauty? AI will eventually neither be able to have aesthetic experiences nor to make judgments of taste. Still, allowing for weak, empirical rules of taste AI should be able to know about beauty in a weak sense, i.e., identify beautiful objects with a certain likelihood.

Key words : artificial intelligence, aesthetic experience, beauty, feelings, judgments of taste, Kant

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1. Introduction

In his fairytale *The Nightingale* Hans Christian Andersen contrasts the singing of a real nightingale with that of an artificial, mechanic bird. When the latter sings for the first time in front of the Emperor of China and his courtiers, the following happens: “It met with the same success as the real nightingale, and besides it was much prettier to see, all sparkling like bracelets and breastpins. Three and thirty times it sang the selfsame song without tiring.”[1] Putting aside the artificial nightingale’s supposed pretty appearance, it seems that the Emperor and his courtiers find the artificial nightingale’s singing beautiful – even as beautiful as the real nightingale’s singing. Now most readers might doubt that the singing of a mechanic bird, running through one and the same melody again and again, can be as beautiful as the natural singing of a real bird, or can even be beautiful at all; perhaps it is this very reaction that

1) Andersen 2015 – I am very grateful to the organizers of *The First International Conference on Artificial Intelligence Humanities* held at Chung-Ang University (Seoul) on August 16, 2018. Furthermore, I am thankful for the helpful and insightful discussions on the topic of artificial intelligence I had with Prof. Dr. Markus Lohrey, Christian Prust, Elke Schmidt, Prof. Dr. Dieter Schönecker, and Dr. Thomas Sukopp.

Andersen intended to evoke. More than 150 years after the publication of the fairytale – in the age of artificial intelligence (AI) – our abilities concerning the production of artificial 'creatures' go far beyond what Andersen and his contemporaries might have ever imagined, and the thought that AI should be able to produce beautiful music or other works of art is not as absurd as in the time of mechanic birds.[2] It is surely an interesting question of whether AI can produce artworks which are able to evoke aesthetic experiences in the observer or listener. In this paper, however, I will look from the other side, so to speak: can AI as an observer of supposedly beautiful objects know about their beauty?

To answer the question of whether AI can know about beauty one first needs to know what beauty is. Of course, as with most concepts in philosophy, there is no general consensus about the meaning of 'beauty.' I have decided on an approach that has been, both historically and systematically, highly influential – namely, Kant's, which is put forward in the *Analytic of the Beautiful*, i.e., the first part of the *Critique of Judgment*. To rely on Kant's conception of beauty seems to be a promising approach because 1) it is an encompassing and coherent account of beauty, 2) it has been highly influential, and 3) at least its

2) Consider, for instance, AARON, a computer program written and further developed by artist Harold Cohen starting in the early 1970s, which has been designed to produce original artistic images. In 1998 Margaret Boden commented on this program: "The program's drawings are aesthetically pleasing, and have been exhibited in galleries worldwide" (Boden, 1998, p.352). – Still, it remains an open question whether AI is able to possess proper artistic creativity If creativity involves more than learning, applying, and combining rules – and it seems highly plausible that there is more about being creative, e.g., consciousness, emotions, intentionality, and autonomy – it seems still unlikely that AI is already able to be properly creative. For a helpful discussion, see Boden 2014. Interestingly, Boden concludes: "If we take the argument about autonomy seriously, then we can agree that 'AI creativity' is a contradiction in terms, even though a computer's performance may be very much more independent of its program than is usually assumed" (Boden, 2014, p.242).

most basic theses are shared by a good amount of recent aestheticians.

This paper consists of four sections. In the first section I will introduce four basic assumptions concerning AI and beauty. Relying on these assumptions, I will answer the question: "Can AI know about beauty?" In order to do so, I will split this general question into three more specific sub-questions. In the second section I will answer the question of whether AI can have *aesthetic experiences*. In the third section I will answer the question of whether AI can make *judgments of taste*. As the answers to both questions will be negative, I will ask in the final section whether AI can, at least, know about beauty in a weak sense.

2. Four Basic Assumptions

It would be somewhat presumptuous to aim at developing an encompassing account of AI. Instead, I will just put forward two basic assumptions concerning AI which are of great importance when it comes to beauty. These two assumptions read as follows:

AI1 Whatever AI is able to do, it is only able to apply rules (algorithms).
AI2 AI is not able to have feelings or emotions proper.

The first assumption, AI1, refers to abilities we can attribute to AI at our current stage of technological development. Thus, even though there might be quantum computers in the future which might not or not only implement rules, all we have right now are 'Turing machines' only capable of implementing rules. Furthermore, even if some forms of AI are able to 'learn' (as unsupervised or self-organizing systems),[3] whatever

they learn are rules. And even if some forms of AI consist of highly complex neural networks, these neural networks still work by implementing rules.

The second assumption, AI2, is faced with the following challenge: Don't we have established affective computing yet?[4] And should we not acknowledge that, in terms of such affective computing, AI should be able to have feelings or emotions? It is beyond doubt that AI is able to recognize and interpret feelings and emotions shown by human beings, e.g., by detecting and processing facial expressions. An AI might even be able to react to the emotions it has recognized, e.g., by typical phrases or gestures. Moreover, AI is also able to simulate certain feelings or emotions, e.g., by simulating facial expressions and typical behavior or by using typical phrases. But is that enough to claim that AI can have feelings or emotions proper? Isn't there something that it lacks? What is missing, I suppose, is the quality of a feeling or emotion proper, i.e., the 'what it is like.'[5] As feelings and emotions essentially involve a quality – the quality is constitutive to feelings and emotions – AI is not able to have feelings or emotions proper. I should highlight that Kant too is aware of feelings essentially being *qualitative* mental states. This is confirmed by his saying that feelings "must be *felt*, not understood" (FI: 232). Obviously, the possibility of experiencing

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3) See Franklin(2014), p.24.

4) On the homepage of the MIT affective computing group it says: "**Affective Computing** is computing that relates to, arises from, or deliberately influences emotion or other affective phenomena." Note that this definition does not say that affective computing would consist in having emotions.

5) Obviously, I take this slogan from Thomas Nagel's influential paper *What it is like to be a bat* (1974). At least, my argument in this paper has Nagel's argument (the so-called knowledge argument or argument from explanatory gap) in its background. In this volume, Dieter Schönecker's paper also makes use of this argument and applies it to the Kantian feeling of respect. See subsection 1.4 in Schönecker 2018 (in this volume).

qualitative mental states depends on having some kind of consciousness. Certainly, I do not want to argue that AI in principle will never be able to obtain consciousness. Who could predict with absolute certainty that, once neural networks get more and more complex or qualitatively different AI such as quantum computers can be produced, some kind of consciousness could not emerge?[6] All I want to claim is that right now we have little evidence that an AI endowed with consciousness already exists, and it is only this current state of technological development that I am interested in.

Let's turn to beauty. As already noted the discussion I present in this paper is grounded on Kant's conception of beauty. Nonetheless, the following two assumptions concerning beauty are shared by most recent aestheticians. They read as follows:

B1 Beauty is essentially constituted by feelings (of pleasure).

B2 There are no rules of taste determining which objects or properties of objects are beautiful (e.g., "All symmetric objects are beautiful.") and such rules are principally not possible.

B1 amounts to the claim that beauty is not an objective property, but that it is only constituted by some relation to human beings. Put another way, the beauty of 'object x' *consists* in human beings having a certain feeling of pleasure when observing 'x' with an aesthetic attitude.[7] Thus beauty presupposes creatures with the ability to have those feelings.

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6) For a similar point see again Schönecker 2018 (subsection 2; in this volume).

7) Some authors will make beauty a so-called relational property, i.e., the property of an object 'x' to evoke a certain feeling in human beings (see for example Reicher, 2011, p.222). But even in such conceptions, beauty is dependent on the feelings of human beings.

Let's turn to B2. Kant is very clear that "there can be no objective rule of taste that would determine what is beautiful through concepts" (CJ: 231).[8] This holds for rules determining directly which objects are beautiful, e.g., "All symmetric objects are beautiful", as well as for indirect rules determining which objects relate to a feeling of pleasure, e.g., "All symmetric objects bring about a feeling of pleasure in the beautiful." What are Kant's reasons for rejecting such (objective) rules of taste? His first reason relates directly to B1: if there were rules of taste, feelings would become dispensable in recognizing beauty. For, if there were rules of taste, one could gain the insight that 'object x' is beautiful by just applying these rules and without having a feeling of pleasure while observing 'x'. Kant mentions a second reason for the impossibility of rules of taste. If there were rules of taste, beauty would only be a (special) kind of cognition. Beauty, however, is not a kind of cognition, but makes up its own realm.[9] Thus, if one wants to keep beauty's status as a distinct category, one should subscribe to B2.

By now we have developed an appropriate theoretical background to answer the question of whether AI can know about beauty. As already noted, we should break this general question up into three sub-questions. These sub-questions focus on three different phenomena with regard to beauty: the *aesthetic experience*, i.e., the experience a person has when approaching a beautiful object 'x' with the appropriate aesthetic attitude; the *judgment of taste*, i.e., the judgment "'x' is beautiful"; and *the knowledge (in a weak sense) that the object 'x' is beautiful*, i.e., the

8) Citations to Kant's *Critique of Judgment* (CJ) and the *First Introduction to the Critique of Judgment* (FI) are to the page number of the Academy Edition. I cited from the translation by Paul Guyer (*The Cambridge Edition of the Works of Immanuel Kant*), Cambridge 2000. Citations to the *Critique of Pure Reason* (CPR) are to the A/B page numbers of the first and second editions.

9) See CJ: 228.

identification of a beautiful object as such. Accordingly, we should investigate the following three sub-questions: Can AI have aesthetic experiences? Can AI make judgments of taste? Can AI know about beauty?

3. Can AI Have Aesthetic Experiences?

When a person is confronted with a beautiful object and experiences its beauty, this experience is traditionally called the "aesthetic experience." We have already learned that, for Kant, a certain feeling of pleasure is constitutive for beauty. Therefore, it should not come as a surprise that, in Kant's theory of beauty, the aesthetic experience amounts to an experience of that same feeling of pleasure. Most prominently, the specific feeling that is constitutive for beauty is characterized as a feeling of *disinterested* pleasure: a feeling which is detaching from any desiring or intellectual willing.[10] Relying on the aesthetic experience understood as an experience of pleasure, we can come up with the following adjusted version of B1:

B1* Aesthetic experiences are essentially constituted by the feeling of disinterested pleasure.

Taking into account that aesthetic experiences are constituted by a feeling of pleasure (B1*) and that AI cannot have feelings proper (AI1), we can easily conclude that AI is unable to have aesthetic experiences:[11]

10) See CJ: 204 f. – For my understanding of Kant's theory of disinterested pleasure see Berger 2018b and Berger 2019.

11) Note that this argument only holds if the pleasure in the beautiful is to be understood

P1	Aesthetic experiences are essentially constituted by the feeling of disinterested pleasure (B1*)
P2	AI is not able to have feelings or emotions proper. (AI1)
Therefore:	AI is not able to have aesthetic experiences.

When an AI enters the *Van Gogh Museum* in Amsterdam and comes across the painting *Wheatfield with Crows*, it can probably apply a lot of rules, but it will not *feel* anything. Hence, it cannot experience the supposed beauty of this work. But what about *judging* Van Gogh's painting to be beautiful? Is this something AI could do?

4. Can AI Make Judgments of Taste?

Kant employs the term "judgment of taste" to refer to the judgment "'x' is beautiful" (e.g., "Van Gogh's *Wheatfield with Crows* is beautiful"). One of Kant's main thesis concerning such judgments is: "The judgment of taste is aesthetic" (CJ: 203). This thesis might seem a bit odd to 21st century readers. For in contemporary thinking the term 'aesthetic' seems to designate nothing but the realm of beauty, art, etc.[12] For Kant, however, aesthetic judgments are not exclusively about beauty – judgments about the agreeable are also aesthetic. Rather, an aesthetic judgment is defined by the fact that its predicate does not capture a

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as a *qualitative* mental state. In the secondary literature Guyer has argued for an "opaque sensation model" of pleasure (Guyer, 2018, p.64) relying on which "feelings of pleasure are all qualitatively identical" (Guyer, 2018, p.155). However, even on this model pleasure seems to have a quality in the first place.

12) This use of 'aesthetic' dates back to Baumgarten's *Aesthetica*. See: "AESTHETICA (theoria liberalium artium, gnoseologia inferior, ars pulcre cogitandi, ars analogi rationis) est scientia cognitionis sensitivae" (Baumgarten, 2007, p.10).

property of an object, but expresses a pleasure or a displeasure.[13] Thus, the judgment "'x' is beautiful" means "'x' is connected to the feeling of pleasure in the beautiful."[14] Furthermore, the "determining ground" of an aesthetic judgment "cannot be other than subjective" (CJ: 203), i.e., it can only be justified by the feeling of pleasure which is actually being felt by the subject. All this amounts to the fact that a judgment of taste can only be made by referring to one's actual feeling of pleasure in the beautiful. Most importantly, one cannot make a judgment of taste by applying an objective rule of taste, i.e., a rule of the kind: "All objects that have the property 'p' are beautiful."[15] In Kant's words: "There can be no objective rule of taste that would determine what is beautiful through concepts. For every judgment from this source is aesthetic, i.e., its determining ground is the feeling of the subject and not a concept of an object" (CJ: 232).[16]

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13) In the secondary literature on Kant's theory of beauty, most authors agree that the predicate "is beautiful" does not capture the property of an object. However, Karl Ameriks defends the view that beauty indeed is a property of the object. See Ameriks, 2003, pp.285-243.

14) See also: "In order to decide whether or not something is beautiful, we do not relate the representation by means of understanding to the object for cognition, but rather relate it by means of the imagination (perhaps combined with the understanding) to the subject and its feeling of pleasure or displeasure" (CJ: 203).

15) Kant allows for a so-called subjective principle of taste which he identifies with the (aesthetic) common sense (see CJ: 238). I cannot go into detail, but just want to mention three crucial characteristics of this principle: (1) it does not determinate a property of the object, i.e., it is no *objective* principle; (2) it does not render the feeling of pleasure dispensable; (3) rather, it is nothing but the faculty to have a feeling of pleasure – namely, the faculty of taste itself. As AI does not have any faculty to have a feeling of pleasure (AI2), it does not have any grasp on the subjective principle of taste.

16) See also: "If one judges objects merely in accordance with concepts, then all representation of beauty is lost. Thus there can also be no rule in accordance with which someone could be compelled to acknowledge something as beautiful. Whether a garment, a house, a flower is beautiful: no one allows himself to be talked into his judgment about that by means of any grounds or fundamental principles" (CJ: 215 f.).

Relying on the status of the judgment of taste as an aesthetic judgment, we can now adjust B1 and B2:

B1** In order to make a judgment of taste, one needs to have a feeling of pleasure in the beautiful.

B2* In order to make a judgment of taste, one cannot apply rules (of taste).

B1** and AI2 in turn allow the following argument which is similar to the argument concerning aesthetic experience:

P1	In order to make a judgment of taste, one needs to have a feeling of pleasure in the beautiful. (B1**)
P2	AI is not able to have feelings or emotions proper. (AI1)
Therefore:	AI is not able to make judgments of taste.

This argument is not only similar to the argument we put forward concerning aesthetic experience, it also hints at the fact that aesthetic experience is the ground for judgments of taste. It is the actual instantiation of an aesthetic experience (our actual feeling of pleasure in the beautiful while observing an object 'x'), that puts us in the position to judge 'x' to be beautiful, i.e., to make the judgment "'x' is beautiful." So once again, it is AI's inability to have feelings proper that prevents it from making judgments of taste.

But it is not only its inability to have feelings, but also its restriction to the ability of applying rules which prevents AI from making judgments of taste. This is demonstrated by the following argument, which is based on B2* and AI1:

P1	In order to make a judgment of taste, one cannot apply rules of taste. (B2*)
P2	AI is only able to apply rules. (AI1)
Therefore:	AI is not able to make judgments of taste.

Both arguments show that AI is not able to make the judgment "'x' is beautiful." Being confronted with Van Gogh's *Wheatfield with Crows*, an AI not only cannot have an aesthetic experience, it also cannot make the judgement: "*Wheatfield with Crows* is beautiful."

5. Can AI Know about Beauty?

Relying on the last two sections, it seems as if AI is precluded from the realm of beauty. But is it not the case that AI already can identify some kinds of beautiful objects (at least, with a high likelihood), like beautiful human beings?[17] And should we not allow for the possibility that AI can know about beauty, at least in a weak sense?

To know about beauty in a *weak* sense would entail an ability to identify beautiful objects as such, without experiencing their beauty in terms of the aesthetic experience. But how could AI know about beauty without having an aesthetic experience? The most natural way would consist in applying a rule – and remember that this is the only thing AI

17) For instance, think of *LKBL – The Beauty App* which is supposed to measure the beauty of human faces in photos. Based on neural networks and machine learning, this app makes use of the ratings that millions of photos showing people's faces have received on dating websites. It should be noted that this app probably focuses more on attractiveness than beauty, should one allow for this distinction. – Besides human beauty, work has been done on measuring the beauty of outdoor places by Seresinhe, Preis, and Moat. They trained neural networks to identify beautiful outdoor places by making use of the ratings of images from the online game *Scenic-Or-Not* (see Seresinhe, Preis & Moat 2017).

can do (AI1). However, as has been shown prior, Kant strictly precludes the possibility of (objective) rules of taste, i.e., of rules by which we could identify beautiful objects (B2). Nonetheless, I want to suggest that this prohibition only applies to strong rules of taste, i.e., *a priori* rules by which we could identify with absolute necessity that an object is beautiful, and by relying on which we could make judgments of taste. This prohibition does *not* apply to what one might call 'weak rules of taste.' A weak rule of taste (1) is not a rule *a priori* and, hence, does not determine with absolute necessity that a certain object is beautiful. (2) It neither gives rise to aesthetic experience (the feeling of pleasure in the beautiful), nor can it ground judgments of taste. But (3) it can either restrict the realm of objects potentially qualifying for being beautiful, i.e., determine that specific objects cannot be beautiful, or determine with a certain likelihood that an object 'x' is beautiful. In what follows I will demonstrate that Kant allows for such weak rules of taste. I will identify three different types of weak rules of taste at which Kant either hints in the *Analytic of the Beautiful* or which could be constructed by relying on central features of Kant's theory.[18)]

5.1. Rules of Perfection

The first type of rules I want to introduce are *rules of perfection*. In order to develop this type of rules, we should first say a few things on Kant's conception of perfection and on how this conception is integrated into his account of *adherent beauty*. For Kant, perfection is

18) Note that, whereas most of what has been said on beauty so far is shared by most contemporary aestheticians, what follows is more specific to Kant's aesthetics and, naturally, more controversial.

a special kind of purposiveness – namely, *objective inner purposiveness*. Such purposiveness is given once an object fits its inner purpose, where the latter determines what the object itself is supposed to be.[19] More concretely, the concept of an object's inner purpose determines the features an object should possess, as well as the proportion in which these features should fit together. Thus, an object is perfect once it possess all features in the right proportion as being determined by the object's inner purpose. For instance, the concept of the inner purpose of a horse determines that a horse should have a head, four legs, two eyes, two ears, a mane, etc., given in a symmetric order and a certain proportion. If a given horse fulfils all of these criteria, I would judge it to be perfect. But if it lacks one of these criteria or presents them in an inappropriate proportion (if it has only three legs or if its head is far too small), I would judge it to be imperfect.

How do perfection and beauty relate to each other? Kant is very clear on a strict separation of beauty and perfection; beauty is not a kind of perfection, and judgments of taste are not judgments about perfection.[20] For if they were, judgments of taste would just be another kind of judgments of cognition; yet they are aesthetic judgments and, hence, distinct from cognition (B1** and B2*).[21] Still, Kant allows for

19) See CJ: 227. – Kant also knows about outer purposes which determine what an object is supposed to be useful for, i.e., what an object is supposed to be in relation to another object.

20) Obviously, Kant uses this distinction to detach his own conception of beauty from the one of Baumgarten who understands beauty as a clear, but confused representation of perfection (see CJ: 227 ff.).

21) Andrea Esser has thus spoken of the *autonomy* of aesthetic judgment (see Esser, 1995, pp.9-11). For Kant's argument by which he detaches beauty from perfection see: "Now the judgment of taste is an aesthetic judgment, i.e., one that rests on subjective grounds, and its determining ground cannot be a concept, and thus not a concept of a determinate end. Thus by beauty, as a formal subjective purposiveness, there is not conceived any perfection of the object as a supposedly formal but yet also objective

combined judgments of perfection and of taste. This is what happens in the case of so-called *adherent beauty*. Adherent beauties "presuppose a concept of the end that determines what the thing should be [i.e. a concept of an inner purpose; L.B.], hence a concept of its perfection" (CJ: 230). Thus adherent beauties are conditioned by the object's perfection. I suggest that we should understand Kant as hinting at the following two-staged procedure of judging: For the first step, we judge an object with regard to its perfection. If we judge the object to be perfect (or at least not imperfect) we can, as the second step, judge the object either to be beautiful or not beautiful. Note that the object's perfection does not render it beautiful, but just preserves the possibility that it could potentiality be beautiful. However if, in the first step, we judge the object to be imperfect, then we cannot judge it to be beautiful in the second step. Thus, an object's imperfection hinders its ability to be deemed beautiful (at least in terms of adherent beauties). Relying on this two-staged procedure we can come up with two weak rules of taste respectively rules for adherent beauties:

WR1a If an object is perfect, it can be either beautiful or not beautiful. (E.g., if a horse has four legs, a head, a symmetric face etc. in the right proportion, it can be either beautiful or not beautiful.)

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purposiveness, and the distinction between the concepts of the beautiful and good, as if both differed only in logical form, the former being merely a confused but the latter a distinct concept of perfection while they were otherwise identical in content and origin, is null, because in that case there would be no specific difference between them, rather a judgment of taste would be just as much a cognitive judgment as the judgment whereby something is declared to be good" (CJ: 228). – Note that it would be much more likely that AI could make judgments of taste proper, if the latter were just a specific kind of judgments of cognition.

WR1b If an object is not perfect (i.e., imperfect), it cannot be beautiful. (E.g., if a horse lacks one or more of the properties of having four legs, a head, a symmetric face etc., or these properties do not fit together in the right proportion, it cannot be beautiful.)

Returning to our general topic of AI, we are now in a position to argue that AI can apply certain weak rules of taste, namely the two rules of perfection just mentioned. AI should be able to do both of the following:

1. AI can determine which objects potentially qualify for being beautiful (as adherent beauties).
2. AI can determine which objects do not qualify for being beautiful and are thus precluded from the realm of (adherent) beauty.

Thus AI, to a certain degree, can know about potential beauty and non-beauty. Still, the rules and restrictions it imposes do not apply to free beauties and pure judgments of taste.[22] Since, for Kant, pure beauties make up the core of his theory as well as of beauty itself, AI, if it could only apply the two rules outlined above, would miss the most crucial cases of beauty. But again, we should not too hastily draw our conclusions. For there are still two cases of weak rules of taste left, and, as we shall see, these rules also apply to cases of pure beauty.

5.2. Empirical Rules

In order to make a proper judgment of taste, one has to have a

22) See CJ: 229 f.

feeling of pleasure in the beautiful while observing 'x'.[23] This was captured by the assumption B1**:

B1** In order to make a judgment of taste, one needs to have a feeling of pleasure in the beautiful.

Because judgments of taste are bound to instantiations of pleasure the subject feels while observing a distinct object 'x', they are always singular judgments, i.e., they have always the form "*This 'x'* is beautiful"; they can never be universal judgments of the kind "*All* 'x's' are beautiful." Nonetheless, Kant acknowledges that we are able to make judgments like "*All* 'x's' are beautiful" (e.g., "All roses are beautiful"). Yet such judgments are not *aesthetic* judgments and, hence, not judgments of taste. Rather, it is a "logical judgment" which "arises from the comparison of many singular ones [i.e., judgments of taste; L.B.]" (CJ: 215). In order to come up with the judgment "All roses are beautiful", one has to compare many judgments like "This rose 'a' is beautiful", "This rose 'b' is beautiful", "This rose 'c' is beautiful", etc. The resulting judgment "All roses are beautiful" is universal and therefore exhibits the characteristics of a rule.[24] Though, it is only an empirical and, hence, a general rule, which allows for exceptions.[25] If a person has come up with the (empirical) judgment "All roses are beautiful" and applies it to the given case of a rose, she could only determine with a certain likelihood – but not with strict necessity – that

23) See: "In regard to logical quantity all judgments of taste are singular judgments. For since I must immediately hold the object up to my feeling of pleasure and displeasure, and yet not through concepts, it cannot have the quantity of an objectively generally valid judgment" (CJ: 215).

24) See CPR: A113

25) This is due to the famous *problem of induction*. For Kant's version of it see CPR: B3 f.

this particular rose is beautiful.

Concerning the second type of weak rules of taste, we should keep the following in mind:

WR2 By comparing a large number of judgments of taste concerning a certain type of beautiful objects (e.g., roses), one can form the weak (empirical and general) rule of taste "All 'x's' are beautiful" (e.g., "All roses are beautiful").

This possibility of empirical rules enables AI to do the following two things:

1. AI could apply general rules of the type "All 'x's' are beautiful" and come up with judgments like "This 'x' is beautiful".
2. AI could itself (as an unsupervised or self-organizing system) come up with rules of the type "All 'x's' are beautiful" by comparing judgments of taste made by human beings.[26]

By applying rules like "All roses are beautiful", AI could identify beautiful objects (even pure beauties) with a certain likelihood and make judgments like "This rose is beautiful." In that way, AI could know about beauty. However, the judgment "This 'x' is beautiful", which is achieved by applying an empirical rule, does not amount to a judgment of taste because it is not based on a feeling of pleasure. Therefore, AI

26) Interestingly, Arvind Krishna, Senior Vice President of Hybrid Cloud and Director of IBM Research, is quoted on the IBM website concerning *The quest for AI creativity* to describe that same procedure: "I think teaching AI what's melodic or beautiful is a challenge of a different kind since it is more subjective, but likely can be achieved. You can give AI a bunch of training data that says, 'I consider this beautiful. I don't consider this beautiful.' And even though the concept of beauty may differ among humans, I believe the computer will be able to find a good range."

still cannot make judgments of taste.

5.3. Rules Drawn from the Subject's Inner State

Kant's theory of beauty is not concerned with any definite criteria an object should meet in order to count as beautiful. If Kant were to identify sufficient criteria for an object to be beautiful, the pleasure in the beautiful would become dispensable and beauty would become a kind of cognition. Furthermore, sufficient criteria for beautiful objects could ground rules of taste, which, given B2, is impossible. Instead of being concerned with criteria for beautiful objects, Kant is interested in the subject's inner state while having an aesthetic experience. Indeed, large parts of his theory amount to an encompassing characterization of the subject's inner state that grounds the pleasure in the beautiful. The core of this characterization is what Kant calls the *free and harmonious play of the imagination and the understanding*.[27] I cannot develop an account of this highly complicated notion in this paper.[28] Rather, I will simply introduce two aspects of which the *free and harmonious play* consists:

1. The imagination plays freely with forms, i.e., it can try out different forms given a certain manifold of sensations.
2. The understanding proves alongside the *a priori* principle of reflective judgment if the forms being apprehended by the imagination would potentially qualify for being subsumed under a concept. As the forms are

27) See CJ: 217 f.

28) For a very brief overview see Berger 2018a. – I offer an encompassing account in my dissertation (*Kants Theorie des Schönen – eine kommentarische Interpretation zu den §§ 1-22 der Kritik der Urteilskraft*) which will be published soon.

found to be apt for a concept, imagination and understanding enter a state of unification, i.e., a state of harmonious interaction.[29)]

This characterization is deeply bound to Kant's understanding of human nature and its different sensible and intellectual faculties. Therefore, it may be unclear as to how this insight into the inner state of the free and harmonious play bears any direct relevance to how AI might come to know about beauty. Still, I want to argue that the two aspects of the free play can be insightful in identifying two rather vague, implicit, and weak criteria, for beautiful objects. These two criteria read as follows:

WR3a Beautiful objects need to be endowed with a certain complexity and irregularity so that the imagination can play with forms. To wit, "[a]ll stiff regularity (whatever approaches mathematical regularity) is of itself contrary to taste" (CJ: 242).

WR3b Beautiful objects need to be endowed with a minimum of regularity so that the understanding could potentially subsume it under a concept. For it is "regularity that leads to the concept of an object" (CJ: 241).

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29) This is my interpretation of the understanding's role as well as the role of the *a priori* principle of reflective judgment in the free play of the faculties. Furthermore, the comparison alongside the *a priori* principle is my answer to the question of which role concepts take over in the free play. Note that my account differs from so-called "precognitive" accounts in which no concepts at all are applied in the free play, as well as "multicognitive" accounts which claim the application of "an indeterminate or open-ended manifold of concepts for the manifold of intuitions" (Guyer, 2006, p.165 f.; for a similar classification see Kern, 2000, pp.50-55). My approach is also to be differentiated from Guyer's "metacognitive" approach which claims that, on the one hand, we determine the beautiful object by the application of a determinate concept, while, on the other hand, our experience of this object exceeds this conceptual determination (see Guyer, 2006, p.182). For a detailed account of my interpretation see Berger 2019.

These rules are far too vague to be of use in finding out whether an object is beautiful or not beautiful. Still, relying on people's judgments of taste, one could find out empirically under which conditions an object is too simple and regular (or too irregular and complex) to count as beautiful. Also, it might be possible that one could discover empirically how maximally complex and irregular as well as minimally regular an object approximately has to be in order to count as beautiful. Thereby, once again, one could provide an empirical rule which could be applied to concrete objects, thereby determining whether they are beautiful or not. Most crucially, all of this could be done by AI:

1. AI could apply the two rules formulated above thereby precluding extremely regular and simple or irregular objects from the realm of beauty.
2. AI (as unsupervised or self-organizing systems) could concretize these (vague) rules by comparing the complexity and regularity of objects human beings typically find beautiful. Thereby, AI could establish empirical rules like "All objects that show a certain degree 'y' of complexity and a certain degree 'z' of regularity, are beautiful." By applying such empirical rules AI could come up with the judgment "This 'x' is beautiful."

By implementing these procedures, AI could identify non-beautiful objects as well as beautiful objects with a certain likelihood, and could even make the judgment "'x' is beautiful." Though, once again, we should be aware that this judgment would not be an actual judgment of taste because it was not grounded in a feeling of pleasure.

6. Concluding remarks

Let's return to the AI moving through the *Van Gogh Museum* and observing *Wheatfield with Crows*. Supposing that *Wheatfield with Crows* is a beautiful painting, how could we expect the AI to react? And what would it be able to know with regard to the painting's beauty? It surely could not have an aesthetic experience, i.e., feel a pleasure in the beautiful. Because it could not have a feeling of pleasure in the beautiful and because judgments of taste are grounded in this feeling the AI could not make a true judgment of taste ("'x' is beautiful"). Still, the AI could come to know about beauty in a weak sense. For example, being a self-organizing system, it could have had compared a lot judgments about Van Gogh's paintings made by human beings and came up with the judgment "All paintings by Van Gogh are beautiful." By applying this empirical rule, the AI could identify *Wheatfield with Crows* as a beautiful painting. Furthermore, it could apply an empirical rule concerning the minimal complexity and maximal regularity of beautiful objects and, once again, come to the conclusion that *Wheatfield with Crows* is beautiful. Leaving the museum and seeing a lady with a three-legged dog cross the street, the AI could determine that this dog is imperfect and, hence, non-beautiful (in terms of an adherent beauty). So it seems that AI could 'know' a lot about beauty and determine in many cases that objects are beautiful (or non-beautiful), at least with a high likelihood.

But should we consider this a great asset? Probably not. Even though AI could know about beauty, it misses the core of what beauty really is about – namely, to have a feeling of pleasure with a very specific quality. In this respect an AI moving through the *Van Gogh*

Museum would be in a similar position as Mary who knows everything about colors in terms of physical facts, while living in a black-and-white room.[30] Still, it is not the case that Mary knows, strictly, i.e., phenomenologically speaking, what colors are all about. By the same token, AI misses all that there is about beauty.

30) I take this example from Frank Jackson's well-known paper *What Mary Didn't Know* (1986).

References

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FI = First Introduction to the *Critique of Judgment*
CPR = *Critique of Pure Reason*

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