**[Can we understand computational art?](http://nceonline.zju.edu.cn/new/books/book4/cached_general/u7_in_class_reading.htm" \l "null)**

[1] If ***the e\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of c\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ minds (***如果***人工大脑中可能出现意识)*** is possible, those minds will ***feel the u\_\_\_\_\_\_\_\_\_\_\_\_\_ to create art.*** But will we be able to understand it? To answer this question, we need to consider two ***\_\_\_\_\_\_\_\_\_\_\_\_\_***: When does the machine become an \_\_\_\_\_\_\_\_\_\_\_\_\_ of an artwork? And how can we form an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the art that it makes?

[2] Em***\_\_\_\_\_\_\_\_\_\_\_\_\_,*** we a***\_\_\_\_\_\_\_\_\_\_\_\_\_***, is the force \_\_\_\_\_\_\_\_\_\_\_\_\_ our capacity to understand w\_\_\_\_\_\_\_\_\_\_ of art. Think of what happens when you are ***c\_\_\_\_\_\_\_\_\_\_\_\_\_ with an artwork.*** To understand the p***\_\_\_\_\_\_\_\_\_\_\_\_\_***, you use your own ***c***\_\_\_\_\_\_\_\_\_\_\_\_\_ ***experience*** (***自己的意识经验***)to ask what could possibly m***\_\_\_\_\_\_\_\_\_\_\_\_\_*** you to make such an artwork yourself — and then you use that ***first-\_\_\_\_\_\_\_\_\_\_\_\_\_ p\_\_\_\_\_\_\_\_\_\_\_\_\_***to try to ***c\_\_\_\_\_\_\_\_\_\_\_\_\_ to a plausible explanation*** that allows you to relate to the artwork. Your i***\_\_\_\_\_\_\_\_\_\_\_\_\_*** of the work will be personal and could ***\_\_\_\_\_\_\_\_\_\_\_\_\_ significantly from the artist's own reasons***. But if we ***share sufficient e\_\_\_\_\_\_\_\_\_\_\_\_\_ and cultural \_\_\_\_\_\_\_\_\_\_\_\_ (文化参照)***, it might be a p***\_\_\_\_\_\_\_\_\_\_\_\_\_*** one, even for the artist.

[3] But the artist and you share something f***\_\_\_\_\_\_\_\_\_\_\_\_*** more important than cultural b***\_\_\_\_\_\_\_\_\_\_\_\_\_***: You share a similar kind of body and, with it, a similar kind of perspective. Our s***\_\_\_\_\_\_\_\_\_\_\_\_\_*** human experience ***s\_\_\_\_\_\_\_\_\_\_\_\_\_ from being born and slowly educated within a society of f\_\_\_\_\_\_\_\_\_\_\_\_\_ humans (人类同胞)***, from ***the needs and \_\_\_\_\_\_\_\_\_\_\_ (奇妙之处) of our b\_\_\_\_\_\_\_\_\_\_\_\_\_ body***, and from the way it ***d\_\_\_\_\_\_\_\_\_\_\_\_ (决定 不是decide, 不是determine,是另外一个) the space- and time-s\_\_\_\_\_\_\_\_\_\_\_ (时空尺度) we can grasp***. All conscious machines will have shared experiences of their own, but in bodies that will be ***entirely a\_\_\_\_\_\_\_\_\_\_\_\_ to （完全不同的） us***.

[4] We are able to ***e\_\_\_\_\_\_\_\_\_\_\_\_\_with n\_\_\_\_\_\_\_\_\_\_\_\_\_ characters （与非人类角色产生共鸣） or intelligent machines in h\_\_\_\_\_\_\_\_\_\_\_ f\_\_\_\_\_\_\_\_\_\_\_ （人类创作的小说）*** because they have been c***\_\_\_\_\_\_\_\_\_\_\_ （构想）*** by other human beings ***from the only subjective perspective a\_\_\_\_\_\_\_\_\_\_\_\_to us***: What would it be like for a human to behave as X? In order to understand machinic art as such, we would need a way to create a first-person experience of what it is like to be that machine. That is something we cannot do even for beings that are much closer to us. ***It might very w\_\_\_\_\_\_\_\_\_\_\_\_ happen*** that we understand some actions or artifacts created by machines, but in doing so we will ***\_\_\_\_\_\_\_\_\_\_\_***（不可避免地） look at the machine as if it is behaving like a human. Art made by a machine can be m***\_\_\_\_\_\_\_\_\_\_\_*** ***\_\_\_\_\_\_\_\_\_\_\_*** （***解释才是有意义的***） only from the perspective of that machine, and any ***\_\_\_\_\_\_\_\_\_\_\_ human \_\_\_\_\_\_\_\_\_\_\_ (连贯合理的解读)*** will be ***i\_\_\_\_\_\_\_\_\_\_ alien from the machine p\_\_\_\_\_\_\_\_\_\_(在机器看来都将陌生得不可思议)***. ***\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_***(就其本身而论), it will be a m***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** (误解) of the artwork.

[5] But what if we ***g\_\_\_\_\_\_\_\_\_\_ the machine p\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a\_\_\_\_\_\_\_\_\_ to our ways of r\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (赋予机器特权，让它们能够使用我们的推理方法),*** to the human way of looking at the world, to endless examples of human culture? Wouldn't that enable the machine to make art that a human could understand? Our answer is yes, but this would also make the artworks human — not \_\_\_\_\_\_\_\_***\_\_\_\_\_\_\_\_\_***\_\_ (***真正意义上的***) machinic. All examples s***\_\_\_\_\_\_\_\_*** f***\_\_\_\_\_\_\_\_*** (迄今为止) of "art made by machines" are actually just ***straightforward examples*** (***简单实例***) of human art made with computers, with the artists being the computer programmers.

[6] Suppose that your local o***\_\_\_\_\_\_\_\_\_\_\_\_\_\_***is playing Beethoven's S***\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** No. 7 (1812). Even though Beethoven will not be directly responsible for any of the sounds produced there, you would still say that you are listening to Beethoven. Your experience might depend c***\_\_\_\_\_\_\_\_\_\_\_\_*** on the interpretation of the performers, the a***\_\_\_\_\_\_\_\_\_\_\_\_***of the room, the behavior of ***f\_\_\_\_\_\_\_\_\_\_\_\_ audience m\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_（其他听众）*** or your ***s\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of mind.*** But the author of the music? L***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** van ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***.

[7] Why should we change these principles when artists use computers if, in these r***\_\_\_\_\_\_\_\_\_\_*** at least, computer art does not create anything n***\_\_\_\_\_\_\_\_\_\_***? The human artists might not be ***in direct c\_\_\_\_\_\_\_\_\_\_ of*** the final works, or even be able to predict them, but, d***\_\_\_\_\_\_\_\_\_\_*** that, they are the authors of the work. Various products of the same idea — in this case ***formalised as an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (体现为某种算法)*** — are examples of the same work reflecting ***different c\_\_\_\_\_\_\_\_\_\_\_\_\_ conditions (不同背景情况).*** Having a computer ***\_\_\_\_\_\_\_\_\_\_\_\_\_a \_\_\_\_\_\_\_\_\_\_\_\_\_(执行一项程序)*** to build an artwork is no different than ***throwing d\_\_\_\_\_\_\_\_\_\_\_\_***to arrange a piece of music, or ***pursuing countless v\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (公式)***. After all, the idea of machines that make art has an artistic tradition much o***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_（***更悠久的艺术传统***）*** than the c***\_\_\_\_\_\_\_\_\_\_\_\_\_*** trend (当前的趋势) of artworks made by artificial intelligence.

[8] Machinic art is a term that we believe should be r***\_\_\_\_\_\_\_\_\_\_\_\_\_*** for (***\_\_\_\_\_\_\_\_\_\_\_\_\_***) art made by ***an artificial mind of its own v\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***, not for that ***based on (or directed towards 迎合) a human-c\_\_\_\_\_\_\_\_\_\_\_\_ view (人类观点的,以人类为中心的) of art.*** From a human point of view, machinic artworks will still be ***p\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, a\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and computational （程序性的、基于算法并与计算机相关的）.*** They will be creative, because they will be ***\_\_\_\_\_\_\_\_\_\_\_*** （自主的） from a human artist. And they might be ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ （互动的）***, with humans or other systems. But they will not be the result of a human ***i\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(强加于) ideas on a machine.*** Only then will we no longer have human art made with computers, but p***\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** (名副其实的) machinic art.

[9] The problem is not whether machines will or will not develop a sense of s\_\_\_\_\_\_\_\_ (***产生自我意识***) that leads to an e\_\_\_\_\_\_\_\_\_\_\_（欲望） to create art. The problem is that if — or when — they do, they will have such a different world that we will be completely unable to r\_\_\_\_\_\_\_\_\_\_\_ to it from our own subjective, personal perspective. Machinic art will always ***lie \_\_\_\_\_\_\_\_\_\_\_ our ability*** to understand ***(超越我们的理解能力)***  it because the ***b\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of our comprehension (理解力局限)***— in art, as in life — are those of the human experience.

参考答案：

**[Can we understand computational art?](http://nceonline.zju.edu.cn/new/books/book4/cached_general/u7_in_class_reading.htm" \l "null)**

[1] If ***the emergence of consciousness in artificial minds*** is possible, those minds will ***feel the urge to create art.*** But will we be able to understand it? To answer this question, we need to consider two ***sub-questions:*** When does the machine become an ***author*** of an artwork? And how can we form an ***understanding*** of the art that it makes?

[2] ***Empathy***, we ***argue***, is the force ***behind*** our capacity to understand ***works*** of art. Think of what happens when you are ***confronted with an artwork.*** To understand the ***piece***, you use your own ***conscious experience*** to ask what could possibly ***motivate*** you to make such an artwork yourself — and then you use that ***first-person perspective*** to try to ***come to a plausible explanation*** that allows you to relate to the artwork. Your interpretation of the work will be personal and could ***differ significantly from the artist's own reasons***. But if we ***share sufficient experiences and cultural references***, it might be a ***plausible*** one, even for the artist.

[3] But the artist and you share something ***far*** more important than cultural ***backgrounds***: You share a similar kind of body and, with it, a similar kind of perspective. Our ***subjective*** human experience ***stems from being born and slowly educated within a society of fellow humans***, from ***the needs and quirks of our biological body***, and from the way it ***dictates the space- and time-scales we can grasp***. All conscious machines will have shared experiences of their own, but in bodies that will be ***entirely alien to us***.

[4] We are able to ***empathise with nonhuman characters or intelligent machines in human-made fiction*** because they have been ***conceived*** by other human beings ***from the only subjective perspective accessible to us***: What would it be like for a human to behave as X? In order to understand machinic art as such, we would need a way to create a first-person experience of what it is like to be that machine. That is something we cannot do even for beings that are much closer to us. ***It might very well happen*** that we understand some actions or artifacts created by machines, but in doing so we will ***inevitably*** look at the machine as if it is behaving like a human. Art made by a machine can be ***meaningfully interpreted*** only from the perspective of that machine, and any ***coherent human interpretation*** will be ***implausibly alien from the machine perspective***. ***As such,*** it will be a ***misinterpretation*** of the artwork.

[5] But what if we ***grant the machine privileged access to our ways of reasoning,*** to the human way of looking at the world, to endless examples of human culture? Wouldn't that enable the machine to make art that a human could understand? Our answer is yes, but this would also make the artworks human — not ***authentically machinic. A***ll examples so far of "art made by machines" are actually just ***straightforward examples*** of human art made with computers, with the artists being the computer programmers.

[6] Suppose that ***your local orchestra is playing Beethoven's Symphony No. 7*** (1812). Even though Beethoven will not be directly responsible for any of the sounds produced there, you would still say that you are listening to Beethoven. Your experience might depend ***considerably*** on the interpretation of the performers, the ***acoustics*** of the room, the behavior of ***fellow audience members*** or your ***state of mind.*** But the author of the music? ***Ludwig*** van ***Beethoven***.

[7] Why should we change these principles when artists use computers if, in these ***respects*** at least, computer art does not create anything new? The human artists might not be ***in direct control of*** the final works, or even be able to predict them, but, ***despite*** that, they are the authors of the work. Various products of the same idea — in this case ***formalised as an algorithm*** — are examples of the same work reflecting ***different contextual conditions.*** Having a computer ***executing a procedure*** to build an artwork is no different than ***throwing dice*** to arrange a piece of music, or ***pursuing countless variations of the same formula***. After all, the idea of machines that make art has an artistic tradition much ***older*** than the ***current*** trend of artworks made by artificial intelligence.

[8] Machinic art is a term that we believe should be ***reserved for*** art made by ***an artificial mind of its own volition***, not for that ***based on (or directed towards) a human-centered view of art.*** From a human point of view, machinic artworks will still be ***procedural, algorithmic and computational.*** They will be creative, because they will be ***autonomous*** from a human artist. And they might be ***interactive***, with humans or other systems. But they will not be the result of a human ***imposing ideas on a machine.*** Only then will we no longer have human art made with computers, but ***proper*** machinic art.

[9] The problem is not whether machines will or will not ***develop a sense of self*** that leads to an ***eagerness*** to create art. The problem is that if — or when — they do, they will have such a different world that we will be completely unable to relate to it from our own subjective, personal perspective. Machinic art will always ***lie beyond our ability*** to understand it because the ***boundaries of our comprehension*** — in art, as in life — are those of the human experience.