

What makes the “communication  
per se” possible among  
autonomous robots?

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## Idea and terminology (1/2)

- This presentation focuses on a philosophical analysis of communication itself by considering its possible realization among autonomous robots.
- We need to clarify the meanings of the two terms we will use in this talk.
- First, communications are not to be mere information exchanges, which may cover natural phenomena such as chemical reactions on molecular level.
- So, the purely “physical-fact” data exchanges between robots without autonomy, namely between robots as mere tools, are not communications.

## Idea and terminology (2/2)

- Second, here the robot's autonomy means that it can do actions according to its best judgements based on its internal states, and it can doubt and reject any rules or orders imposed on it from the outside.
- In a word, autonomous robots could betray Isaac Asimov's 3 Laws of Robotics because they are not obedient servants of humans.

## Two Questions guiding us

- Now let's begin with two questions which, at first, may not seem intimately related to each other.
- The 1st is; What kind of contents would autonomous robots communicate with each other?
- The 2nd is: What would be required for them to become a Mozart or a Dali?
- I think those two questions reflect a common situation in deep level humans have been facing through their evolution.

# Art-Question

- Now, we will take the question 2, “art-question” in short.
- For humans, considered as a contingent existence only with limited perceptual and reasoning abilities, something happens to be called “is beautiful” just because it has some adaptive value for human survival.
- If humans have had other different capabilities or shortcomings and a different way of evolution from our present ones, the one and same thing would not be called “is beautiful” in that case.
- Of course, that would be true in other possible worlds.

## Anti-Realism of “beauty per se”

- We have many robust arguments showing that beauty itself as a real genuine property does not exist at least in our physical world.
- On the contrary, we have many scientific findings which suggest that the property “seems beautiful” is an objective physical property realized in humans’ brain activities.
- So, the anti-realism of aesthetic properties tells us the following.
- “Beauty per se” resides in or is reduced to, or rather supervenes on “seems beautiful”, namely certain activities of human brains.
- There is no mysterious property of beauty itself in our world, so we don’t need to have any mysterious abilities to catch such an odd property.

## “art-question” again

- Then let's return to our “art-question” again.
- To become a Mozart or a Dali implies to make many masterpieces like Mozart's or Dali's works.
- In this point, robots would have no troubles with installing perceptual devices to detect a property of “beauty per se” because there is no such property at all.
- In other words, robots would need no miraculous performances to make such works of art.
  
- But our answer to the “art-question” is not straightforward.
- Although robots could have enough abilities to generate or perform any works of art found in the human history including Mozart's or Dali's, there is a serious problem for them to be the artists.

## To be a Mozart or a Dali

- The problem is that robots are originally free from any evolutionary constraints and in principle, or abstractly considered, technologically “omnipotent”, like the Almighty, although every robot realized in a concrete situation has its own limitations.
- In a nutshell, robots, as idealized concept, are too free and too powerful to be a Mozart or a Dali.
- The story might remind us of a wisdom some evolutionary biologist suggested us earlier, that there are neither lovely things nor ugly things for God’s eyes because He made them all equally.

# Limitedness makes Creativity

- This situation reflects a general truth that art requires essential limitedness, namely that creativity resides in some finiteness.
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- I would like to say that no limitedness no creativity.
- Therefore, in order to become a Mozart or a Dali, robots have to have some fundamental defects imposed by the contingent circumstances where they find themselves.

# Communication-Question

- Then back to our Question 1, “communication-question”
- Let’s imagine many autonomously living robots and their communications. This case seems essentially the same as art.
- If we did not assume any basic constraints in their lives, we would not find any points in their communications.
  
- Robots’ physical abilities enough to deal with their physical environments do not imply they can detect motivations, interests, or purposes of their communications as physical properties.
- In the same way as the aesthetic anti-realism, the anti-realism of communicative properties would hold because they are necessarily derived from the anti-realist property of “value” itself.

## “desire-satisfying” autonomous systems

- Making a long story short, the essence of the argument is simple.
- The communication is possible only when its contents have some meaning for the participants in the communication.
- And the meaningful contents are possible only when the participants are regarding each other as a “desire-satisfying” autonomous system, in a word an “intentional system” roughly in Daniel Dennett’s sense.

# Folk Psychology

- Folk psychology is a system where agents should be explained in the framework such that their desires and beliefs produce their actions.
- Suppose you were an autonomous robot.
- What kind of contents would you like to convey in your talk with other robots?
  
- Whatever particular contents you talk to your friends, your informational contents should run into the scheme of folk psychology if you hope to maintain the communication itself.
- This scheme constitutes the explanatory triangle of “Desire, Belief, and Action”. And in such explanation, autonomous robots should be able to be both the explaining subjects and the objects being explained.

## Conclusion

- In this context. I would conclude that one of the necessary and constitutive conditions of “communication per se” is the framework of folk psychology.
- And the final words.
- Technology is originally born to overcome finiteness or limitedness, but there is something worth living with precisely because there remains some finiteness or limitedness.
- Thank you.