

Russell Paradox and Extension Set

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A concept of extension set was established in the Art[1]. It will be expounded that Russell Paradox isn't Paradox in the meaning of the extension set in this article.

1. Extension Set and Its zero's bound

In the realistic world, we always meet with some things, which are right and wrong. For example, there are some simiconductors, which can conduct electric and inconducts between the conductor and insulator. The electric conductivity is showed by means of rate of electric conduction. There is some neutral salt between the sour and alkali and the acidity or alkalinity of a matter is showed by means of sour andalkali level. There are quasi-metal tellurium arsenic and selenium etc between metal and non-metal. There are neutral neutron between proton brought positron and electron brought negatron. There is a state whic is between liquid and steam. It is similar state that the temperature of the water rised to 100°C. The level which a matter has some character is showed by means of different target in the different field. That is to say, the right and wrong concept is not only showed qualitative, but also is showed with quantity target. For example, A and B are all conducts, but their conductivity level are different. This difference is showed by the rate of electric conduction A is higher than B.

The concept of extension set is established in order

to show the above thing and it can show that a thing has some nature's level.

Definition 1: The so called "Extension subset \bar{X} " in the objects set U under a restraint is indicated to provide a real number.

$$K_{\bar{X}}(u)$$

for any $u \in U$, by which the relationship of u and \bar{X} is described. The mapping

$$K_{\bar{X}}: U \rightarrow (-\infty, +\infty)$$

$$u \rightarrow K_{\bar{X}}(u)$$

is called a dependent function of \bar{X} .

In this concept, the semiconductor, salt, neutron etc is showed by

$$K_{\bar{X}}(u) = 0$$

Definition 2: If \bar{X} is a extension set, which describes level that a thing have some nature in a iniverse. Then the element which the value of the dependent function is 0 ($K_{\bar{X}}(u) = 0$), is called a critical element, written as u^0 . The set of a critical element is called zero's boundary.

In above sense, $u \in X$ in the classical set is showed by

$$K_{\bar{X}}(u) \geq 0$$

and $u \notin X$ is showed by

$$K_{\bar{X}}(u) \leq 0$$

And

$$K_{\bar{X}}(u) = 0$$

Shows that u is a element which has some nature and not.

2. Russell Paradox isn't Paradox

We prove the Russell Paradox isn't Paradox now.

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mapping

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is established in U and it satisfies with the following condition.

$$1) \quad u \in U, \quad u \in U \text{ [*]} \iff K_{\bar{x}}(u) \leq 0$$

$$2) \quad u \in U, \quad u \in U \iff K_{\bar{x}}(u) \geq 0$$

Then the extension set \bar{x} is established in U . Let

$$A = \{u \mid K_{\bar{x}}(u) \geq 0, u \in U\}$$

We prove that

$$K_{\bar{x}}(A) = 0$$

is right whatever $A \in A$ or $A \bar{\in} A$

First, if $A \in A$, from (1)

$$K_{\bar{x}}(A) \leq 0$$

but $K_{\bar{x}}(A) < 0$ is wrong. Because it is contradiction if it is right, then from (1)

$$A \bar{\in} A$$

But from 2)

$$K_{\bar{x}}(A) \geq 0$$

So

$$K_{\bar{x}}(A) = 0$$

Similarly, if $A \bar{\in} A$, $K_{\bar{x}}(A) = 0$ is true too.

(*Here a sense of " \in " is Russell's sense. The following mention is the same as the above.) So $A \in J^0$ (J^0 is zero's boundary of \bar{x}). That is to say, the set, which consists of all set that is isn't its element in Russell Paradox, is a critical element. It belongs to A and not. So Russell Paradox isn't a Paradox.

In fact, The source of Russell Paradox is in the law of excluded middle. It doesn't admit that thing has some natures and not. But semicondillots, netron, the water of critical State etc these things are in every-where. So the concept of the set, which don't relate that thing looks.

like but been not, and realistic produced some contradictions. So Russell Paradox appear. The reality was joking with the law of excluded middle by Russell.

This also show that the law of excluded middle only used in some range. The paradox appears when the range is exceeded.

3. The law of compromise

If \tilde{X} is a extension set discribed some nature, then there is a zero's boundary J_0 , its elements has these natures and not.

4. Extend

In the sense of the concept of the estension set, we can discribe the changing that a thing is from right to wrong or from wrong to right and discuss the changing way. At the same time, We can mediate some paradox from studing J_0 .

Reference Article

[1] Cai Wen "Extension Set and Non-compatible problem".