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The Topology of Materialized Understanding

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Abstract **– This paper materialize the abstract topology, using the language easy to understand, and introduce "topology", this math concepts as well as the core of it. In the process, we start from the definition of the concept of "topology", introduce the origin of the topology in detail, and reveal the essence of the problem by using the reverse of thinking. Then, we obtain the homeomorphism derived by the inverse of continuous mapping, and take another method--the number of topological strokes explaining the concept of "homeomorphism" which is easy to understand. However, this is not the end of topology. Next, we talk about "genus", which is topological invariance, and use examples to explain it. Finally, we describe the application of the "topology", and regard the 2016 Nobel physics prize to three scientists who has outstanding contributions in the topology as an opportunity to emphasize the topology of the mathematics "root".**

Keywords **– Converse Thinking, Transform Thought, Materialization, Combination of Number and Form.**

I. INTRODUCTION

At present, few researchers study "topology", which is due to that a lot of people think "topology" too difficult. This paper is from the mathematical knowledge as we all know, and introduces in detail the origin of the topology. Then it uses the instances of our life and has a better explanation of the "topology", which makes "topology" more concrete, and makes the reader easier to understand the connotation of the topology.

II. MAIN RESULTS

What's education ? Education is a social phenomenon of culturing people, which is the essential property of education and is also qualitative. Therefore, it can be seen: the connotation of mathematics education is not that the teachers impart knowledge and student learning knowledge blindly, and its core is to grasp deeply mathematical thought, mathematical spirit and perspective. The mathematics focus on it, and discusses knowledge by this way, which is the value in it.

So what's the key to judging a person's math literacy? It goes without saying that the point set topology. In the process of learning of point set topology, we can deeply feel the relation and distinction between it and mathematical analysis, and topology intuitively shows the mathematical abstract and promotion, where is wonderful. When topology teacher made us talk about the understanding of topology at the beginning, I looked through our textbook (point set topology notes, the fourth edition) [1] again after class. The cover writes that point set topology is also known as general topology, and it studies that the continuity of mathematical object and its invariant property in keeping the continuity structure of the object. Then, I found that the first introduction to topology is in chapter two, which describes the definition after the metric spaces and continuous mappings are introduced. It can be seen that there is an inherent connection between them.

Next, let's explore the origin of topology. We use reverse thinking and start with "topology". Topology defines all open set within a space, which is the close degree between the two points, and it is just like the interpersonal relationship in a class. So why do we separate out and defined as "topology" ? The importance of it is evident. "Continuity" is one of the most common features of mathematical analysis, so what is the relation between it and the topology (i.e. the set) ? Let us describe "map" in a row again in your own words. It's that their function values are close enough if two Numbers are very close. This is to say that the inverse of the continuous mapping always put the open set mapping into open set, such as, open interval is open set in R, and closed interval is a closed set, then half closed interval? Therefore, defining the definition of "open set" is to be defined as "topology".

Just we mentioned continuous map of inverse, so, is it a map? The answer is not sure, and we put the continuous inverse mapping called a one-to-one mapping. Thus, we can export to the definition of homeomorphism. Capital normal university mathematics Lin Kai Liang used "bump" problem to illustrate the homeomorphism. It's more wonderful that his friend's comments on: with two strokes writing "bump" this two chinese characters, so it is introduced the "topology stroke number". Then what's the "topology stroke number"? Next we will explain it by the examples.

First of all, the topology stroke number of Chinese characters [2] is aimed to have the same stroke, as we mentioned earlier "bump" topology stroke number is one. Such as, the topology stroke number of the Chinese characters "son", "tian" and "second" are two. Obviously, the topology stroke number of characters is less than or equal to its number of

strokes. It's a little difficult for the topology stroke number of bus routes [3] to describe it. We can imagine that a person has a maze-running and do not go the same way. When we can't find the way every time, we can telesport a time. Then the number of moving is the topology stroke number of the route. Now let's look at the isomers in chemistry, then we have to say the connective words between them -- "graph". The conception of "graph" is defined by Sylvester, a British mathematician, was considered to apply the idea of the graph to chemistry to describe the structure of molecules. Such as the diagram of carbon dioxide molecules is a three-dimensional shape of the bond Angle 180 degree that the carbon is centered with double oxygen. The study of graph theory begins with the problem of determining the topology stroke number. [4]

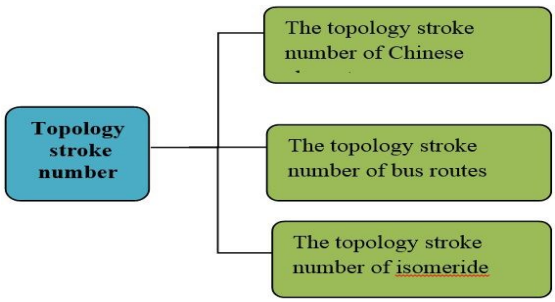

Fig. 1.

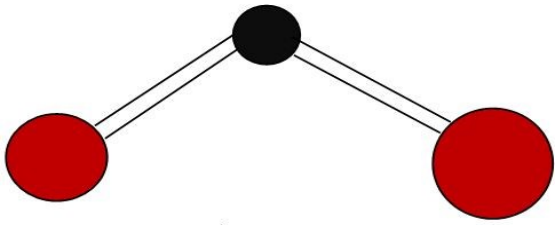

Fig. 2.

According to the study of the topology stroke number, we have explained the concept of "homomorphism", which has the same vertex set (same the topology stroke number) and the same blocks (the same numbers of connected branches). We can't help thinking whether it has any way of intuitive judging homeomorphism, such as the solid ball and hoop homeomorphism problem. We can find a thing which keeps the same in the topology mapping, and find if a "circle" in the hoop corresponds to the solid ball. Obviously, we can't find the "circle", so it's not Homeomorphism about the solid ball and hoop. Under homeomorphism is defined, let's talk about "genus", which is the discussion of the textbooks "topological invariance". Actually we contact topological invariance for a long time, such as 2 = A - B + C. Among them, A is polyhedron's vertices, and B is number of edges, then C is the surface. We can calculate the value is two to the solid convex objects, however, the class of bracelets is zero. Although they have different shapes, we can categorise them, which is also the advantage of topological invariance.

Topology is very widely used, such as it can be found on the bus route which has the application about "topology stroke number" , and "graph theory" can be applied to Chinese characters, chemical, interpersonal relationship network and six degrees of segmentation theory, etc. A Chinese character can be regarded as a graph, and a graph is a collection of many vertices, so it can be used to determine the isomorphism problem between Chinese characters. Similarly, chemical isomers are also made by the isomorphism. In the 2016 Nobel Prize in physics, the prize was awarded to three scientists who have the achievements ton topological phase change and topological phase material, which reflected the wide application of topology.

Topology affects widely human life, so every detail in life is the embodiment of the "topology". Studying topology needs to keep the spirit of respect to learn. We should have a active learning by ourselves rather than passive learning. The topology is abstract, so we should contact it with our daily life which is called the topology of the materialization understanding.

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