

Review of Discrete Function and Texture

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We started the work for understanding discrete function to describe the solitons in the closed form of the states with finite discrete values [1, 2]. The discrete function is the same category of Cellular Automata (CA) [3]. This idea transfers to texture organization, easily [4]. We understand each pixel of texture can draw using discrete function [4, 5]. Our recognized pattern of every texture depends on black and white of every pixel [4, 5]. This black and white pattern is presented and we should consider random texture or organized texture using experimentally texture viewing. The target texture pixel color (black or white) is determined by 3×3 pixels pattern that we call the glider [4, 5]. Thus a texture can be organized by the same mini-texture applying [4, 5]. The texture presenting time is very short so that we should concentrate the looking textures [4, 5]. The answer is random or not, namely yes or no. Using mouse click of left or right the results are collected by the personal computer [6]. Any states of every pixel is possible to form a texture, but actually we used black and white patterns of a texture on random manner or organized min-texture tiling [6]. The presentation of texture is also controlling the same computer on the setting time in the computer program. Thus we can calculate the ratio of correct answers or incorrect answers. These results are depending on the tested people who did the works sometimes or continuous. The experimental results of texture recognition on the way of random or organized ones.

We did recognition of texture patterns using our brain in the experiments. We should write paper newly, so that the idea expand to using oscillator network, sensor input, and so on [7, 8, 9]. We also know Gaussian and mean curvature to describe the topology of surfaces. Thus we applied the curvature ideas to our works [10, 11]. The ideas are mixed each other to organize papers in Memoires of Kokushikan University. The expanded dimension of discrete function is direct way of our idea [4] and applied the idea to the machine control [12, 13,]. We considered possible applications of discrete functions and published many papers.

Boolean algebra of elements $\{0, 1\}$ is fundamental to consider computers [14]. The discrete function using elements $\{0, 1\}$ should expand to three states $\{-1, 0, 1\}$. The three states can use any three integers and furthermore any three materials. The expression for the three states cellular automata gives any expression of three states and expand to any dimension of discrete functions and any size of discrete function. The required matter is one that closed form should be existed there. Our discrete function studies are considered with in this form.

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