A system to support the amateurs to take a delicious-looking picture of foods

Takao Kakimori
kakimori@onailab.com

Makoto Okabe
m.o@acm.org

Keiji Yanai
yanai@cs.uec.ac.jp

Rikio Onai
rikioonai@gmail.com

1. INTRODUCTION

Recently, many people take a picture of foods at home or in restaurants, and upload the picture to a social networking service (SNS) to share it with friends. People want to take a delicious-looking picture of foods, but it is often difficult, because most of them have no idea how to take a delicious-looking picture. There are many photography techniques for composition[1], lighting, color, focus, etc, and the techniques used to take a picture are different for different types of subjects. The problem lies in the difficulty for amateur photographers to choose and apply appropriate ones from such many techniques.

In this paper, we pay attention to *composition* and develop a system to support the amateurs to take a delicious-looking picture of foods in a short time. Our target users are the amateurs of food photography and our target photographic subjects are foods on dishes. There are four steps to take a picture using our system: 1) our system automatically recognizes foods on dishes; 2) our system suggests the composition and the camera tilt, by which the user can take a delicious-looking picture; 3) the user arranges foods and dishes on the table, and set the camera position and tilt; 4) finally, the user takes the picture.

2. METHOD

There are a number of photography composition guidelines to enhance the impact of a scene, e.g., "place your subject in the center", "use the diagonals", "use the Fibonacci spirals", "balancing with the rule of thirds", etc. We assume that these guidelines are useful for food photography. We also assume that the composition suitable for a scene is determined by the following three parameters: 1) the shape of the dish (one of circle, ellipse, rect, and square), 2) ratio of the area of foods to the area of the dish, and 3) the number of side dishes.

Given the dishes, the user first takes the picture of all of them together. Our system then recognizes the name of each food by automatically analyzing the picture with deep convolutional neural networks (DCNN) and our system estimates the three parameters. When the system fails to recognize them, the user can specifies the parameters manually. The system then suggests the composition (the right panel in each pair of Figure 1). The blue area corresponds to the main dish, the green areas correspond to side dishes, and the red line shows the composition rule. The user arranges the dishes on the table according to the composition. When taking the picture, there is the symbol "傾" at the bottom right in the screen, which means inclination in Japanese. When the color of the symbol is black, it means that the camera tilt is not the suggested one. When the camera is in the suggested range of tilt, the symbol becomes purple. This symbol helps the user to know the suggested camera tilt interactively.

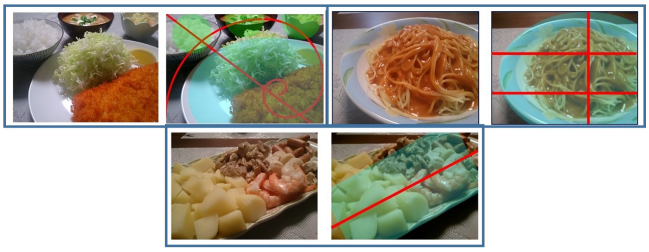

Figure 1: The pictures of foods taken by our system. Each pair shows the picture taken by our system (left) and suggested composition (right).

3. RESULTS AND FUTURE WORK

We present an interface to take a delicious-looking picture of foods with food recognition. This system can let an amateur decide appropriate composition. In top left of Figure 1, there are foods pork cutlet, rice, miso soup and potato salada in a picture. The proposed system uses Fibonacci spiral and diagonals. At the top right, The system uses "rule of thirds". At the bottom, The system uses just diagonals. We will evaluate the proposed system in the near future. We plan two types of user studies. Both of them are subjective evaluations: one is a usability study, and the other is to evaluate the quality of pictures taken by the test users with and without using our system.

4. REFERENCES

[1] Liu, L., Chen, R. and Cohen-Or, L. W. D.: Optimizing Photo Composition, *Computer Graphics Forum*, Vol. 29, No. 2, pp. 469–478 (2010).