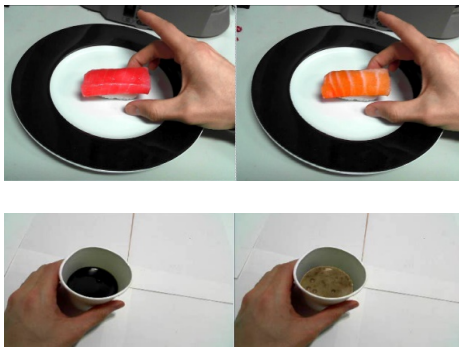
Modified food appearance modifies the taste

- Image processing and crossmodal effect on foods -

Katsunori Okajima
Yokohama National University
okajima@ynu.ac.jp



Food appearance is critical information for estimating edibility, freshness and softness of foods. We developed some image processing techniques to modify the food appearance naturally. The first method is Visual Texture Exchange (VTE). VTE enables us to change the visual texture of a food from the original surface to other actual one, e.g. from Tuna to Salmon, and from Black Coffee to Café Latte in real time (*See top Figures*). The second method is Luminance Distribution Modification (LDM). We found that LDM can modify the moistness and softness of foods in appearance. The third method is Gloss/Shade Filter Operation (GSFO) which can create any Oily/Dried and Burned/Raw foods from an original food image in appearance. By applying such image processing methods and Augmented Reality technology, we are investigating crossmodal effects of food appearance to the taste while keeping the ingredients intact, indicating that we can artificially control the taste by modifying food appearance with image processing. Finally, I will introduce the effects of melanopsin to food appearance as well as cones because melanopsin significantly contributes to brightness perception.

Reference:

Yang, J., Okajima, K., Kanazawa, S., & Yamaguchi,M.K. (2019). Infant can visually differentiate the fresh and degraded foods: evidence from fresh cabbage preference, Frontiers in Psychology, Vol.10 Article# 1553.

Ueda, J., & Okajima, K. (2019). AR food changer using deep learning and cross-modal effects," IEEE AIVR 2019. *in press.*

Yamakawa, M., Tsujimura, S., & Okajima, K. (2019). A quantitative analysis of the contribution of melanopsin to brightness perception, Scientific Reports, 9, Article# 7568.

Biography:

Katsunori Okajima received Ph.D. from Tokyo Institute of technology (Engineering) and joined National Defense Academy in 1990. He was also a visiting research fellow of National Research Council of Canada and a visiting associate professor of Tokyo Institute of Technology. Currently, he is a professor at Faculty of Environment and Information Sciences, Yokohama National University, and a department chair. He is an expert of “five-senses engineering”, such as vision, touch, taste and their crossmodal effects. For studying such topics, he is taking advantage of image processing, Virtual/Augmented Reality, Projection Mapping and Artificial Intelligence. He is the president of Vision Society of Japan, a study group chair of the Virtual Reality Society of Japan, an editorial board member of Color Research and Application, and a group leader of Innovative SHITSUKAN Science and Technologies.

Homepage: http://www.okajima-lab.ynu.ac.jp/