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Title: Computer Vision for Expressing Texture Using Sound-Symbolic Words

Abstract: The major goals of texture research in computer vision are to understand, model, and process texture and ultimately simulate human visual information processing using computer technologies. The field of computer vision has witnessed remarkable advancements in material recognition using deep convolutional neural networks (DCNNs), which have enabled various computer vision applications, such as self-driving cars, facial and gesture recognition, and automatic number plate recognition. However, for computer vision to "express" texture like human beings is still difficult because texture description has no correct or incorrect answer and is ambiguous. In this paper, we develop a computer vision method using DCNN that expresses texture of materials. To achieve this goal, we focus on Japanese "sound-symbolic" words, which can describe differences in texture sensation at a fine resolution and are known to have strong and systematic sensory-sound associations. Because the phonemes of Japanese sound-symbolic words characterize categories of texture sensations, we develop a computer vision method to generate the phonemes and structure comprising sound-symbolic words that probabilistically correspond to the input images. It was confirmed that the sound-symbolic words output by our system had about 80% accuracy rate in our evaluation.

Biography: Dr. Maki Sakamoto is Professor of Affective Engineering in Department of Informatics, The University of Electro-Communications. She received her Ph.D. in Language and Information Sciences from the University of Tokyo in 2000. From 1998 to 2000, she was an Assistant Professor at the University of Tokyo. In 2000 she moved to the University of Electro-Communications as a Lecturer. She became an Associate Professor in 2004 and a Professor in 2015. She is a vice-director of Artificial Intelligence Exploration Research Center. In 2014, she received the best paper award from the Japanese Society for Artificial Intelligence. Her current research interests are in language, cognition, perception, affective engineering including affective AI. She is a board member of JSAI and JCSS