

# SCN-SAM: A Modified Self-Cure Network for Facial Expression Recognition Under Face Masks

Qiang Wu, Kouichi Hamada, Masayuki Arai

*Graduate School of Science and Engineering, Teikyo University, 1-1 Toyosatodai, Utsunomiya, Tochigi, Japan*

**21m107fl@stu.teikyo-u.ac.jp, hamada.kouichi.bq@teikyo-u.ac.jp, arai@ics.teikyo-u.ac.jp**

**Abstract**—Due to COVID-19, wearing masks has become more common. However, it is challenging to recognize expressions in the images of people wearing masks. In general facial recognition problems, blurred images and incorrect annotations of images in large-scale image datasets can make the model’s training difficult, which can lead to degraded recognition performance. To address this problem, the Self-Cure Network (SCN) effectively suppresses the over-fitting of the network to images with uncertain labeling in large-scale facial expression datasets. However, it is not clear how well the SCN suppresses the uncertainty of facial expression images with masks. This paper verifies the recognition ability of SCN on images of people wearing masks and proposes a self-adjustment module to further improve SCN (called SCN-SAM). First, we experimentally demonstrate the effectiveness of SCN on the masked facial expression dataset. We then add a self-adjustment module without extensive modifications to SCN and demonstrate that SCN-SAM outperforms state-of-the-art methods in synthetic noise-added FER datasets.

**Keyword**—Computer Vision, Facial Expression Recognition, Occlusion, Face Mask, SCN-SAM



**Qiang Wu** was born in China, 1995. He received the B.S. degree in Information and Electronic Engineering from Teikyo University, Japan in 2021. He is currently pursuing the M.E. Degree at Teikyo University, Japan.

His main research interests include computer vision, image processing, and deep learning.



**Kouichi Hamada** is a professor in the Graduate School of Sciences and Engineering at Teikyo University. He received the M.E. and Ph.D. degree from the University of Tokyo in 1996 and 2014 respectively. From 1996 to 2003, he was with NHK (Japan Broadcasting Corporation) Science & Technology Research Laboratories. From 2003 to 2021, he was with the Central Research Laboratory, Hitachi Ltd. His research interests include computer vision, natural language processing and information visualization. He is a member of IEICE (Institute of Electronics, Information and Communication Engineers of Japan), ITE (The Institute of Image Information and Television Engineers of Japan) and AIJ (Architectural Institute of Japan).



**Masayuki Arai** is a professor in the Graduate School of Sciences and Engineering and a dean of the Faculty of Sciences and Engineering at Teikyo University. He received his B.E. degree from Tokyo University of Science in 1981 and Dr.Eng. degree from Utsunomiya University in 1995. His research interests include pattern recognition, natural language processing and information visualization. He is a member of the Information Processing Society of Japan and IEEE.