

AI 活用で挑む学問の革新と創成
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フード 3D プリンターと人工知能を使用して食事体験を向上させる計算フードテクスチャ

§ 1. 研究成果の概要

This report summarized the result of the research project called ‘Computational Food Textures for Enhancing Eating Experience using Food 3D Printer and AI’ in the second fiscal year (FY2021).

In this fiscal year, I worked on the data collected through the user experiment to build up the predictor, including the physical measurement (chewing and jaw movement) and perceptual measurement through the magnitude estimation. On average, the experimental results showed that the cookies’ infill patterns (food target) affect the chewing behavior and the mouthfeel. Then, I used the experimental results as the input to build the predictor through the target-based model. As a result, I obtained the g-code parameters that estimate the mouthfeel of the target food. The validation that compares optimized g-code (from the predictor) and original g-code (from the experiment and hyper-parameters) shows that the error is about 10%, which means that the predictor can initially handle the mouthfeel estimation. However, the current predictor only allows for a specific target food (i.e., the cookie) with a limited infill structure. Therefore, I will build up an end-to-end model that allows a cross estimate of the g-code and jaw movement patterns. To do so, it requires additional user experiments that come across the different types of actual food structures, such as wafers, biscuits, and waffles.

【代表的な原著論文情報】

- 1) 宮武大和, プンポンサノン・パリヤ, 岩井大輔, 佐藤宏介. “3D プリント食品内部への情報埋め込み”. 第 84 回情報処理学会全国大会, 情報処理学会, ページ 4:189-4:190, 2022 年 3 月.