FMfl2023 Program	
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Title	**Statistical modeling of time-varying physical quantities for tactile evaluation of automotive materials**
Abstract	In the automotive manufacturing industry, there has been significant progress in automating the production process. When it comes to material selection, some companies evaluate multiple materials using a pressure needle, and based on the results, humans choose the materials that provide a comfortable tactile experience. In this study, we developed a statistical model to investigate how the time-varying physical quantities observed on the surface of each material impact the sensory evaluation through touch. Our proposed model predicts a group based on a set of functions, taking into account quantities that vary over time as a function of time. This approach enables a more precise and quantitative assessment of the tactile properties of materials. Additionally, by utilizing the Karhunen-Loeve expansion of the set of time functions, we uncover the waveform characteristics of the physical quantities over time.