The task of car driving is automated to an ever greater extent. In the foreseeable future, drivers will no longer be required to touch the steering wheel and pedals and could engage in non-driving tasks such as working or resting. Vibrotactile displays have the potential to grab the attention of the driver when the automation reaches its functional limits and the driver has to take over control. The aim of the present literature survey is to outline the key physiological and psychophysical aspects of vibrotactile sensation and to provide recommendations and relevant research questions regarding the use of vibrotactile displays for taking over control from an automated vehicle.

Results showed that a distinction can be made between four dimensions for coding vibrotactile information (amplitude, frequency, timing, and location), each of which can be static or dynamic. There is a consensus that frequency and amplitude are less suitable for coding information than location and timing. Vibrotactile stimuli have been shown to be effective as simple warnings. However, vibrations can evoke annoyance, and providing vibrations in close spatial-temporal proximity might cause a lack of comprehension of the signal. We describe the sequential stages of a take-over process and argue that vibrotactile displays are a promising candidate for redirecting the attention of a distracted driver. Furthermore, vibrotactile displays hold potential for supporting cognitive processing and action selection while resuming control of an automated vehicle. Finally, we argue that multimodal
feedback should be used to assist the driver in the take-over process.