We are presenting a driver model developed within the EU-project interactIVe which classifies visual distraction based on the detection of abnormal driving behavior. The model forwards the information to a Collision Mitigation System and activates an acoustic warning in case of distraction up to 300 ms earlier.

Since the model requires information regarding normal driving behavior to do this, we introduced a design metaphor, focused on using human memory and its ability to construct mental representations. Based on the idea of interpreting multivariate time series as gray-level images, we adapted the concept of mental images for learning situation-based normal behavior. The model transformed the property of long-term memory to store, interfere and forget prototypes of mental images. During driving, we compared the prototypical images stored with the current image to obtain a distraction index. If this index exceeded a certain threshold, the warning was actuated. The driver model was evaluated in a simulator study where the system improvement could be shown.