



Concept for the Overhead Module That Turns Every Ride into Pure Thrill

移動を「ワクワク体験」に変えるオーバーヘッドモジュールコンセプト

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Background

Ways of using cars and spending time in cars are changing. Future mobility service is not simply a means of transportation.

Cars will turn into various spaces: a refreshing space for mind and body, a space for moving experience, or a space that help occupants concentrate.

A space that makes you feel relaxed and inspired



A space that immerses you and your friends in sound and image



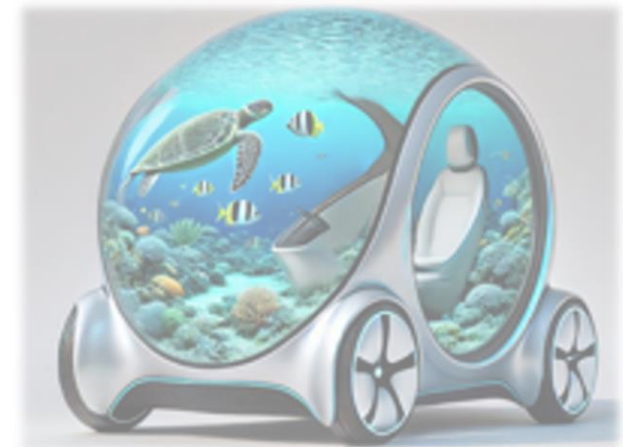
A space that boosts your work or study efficiency



Examples of well-being spaces

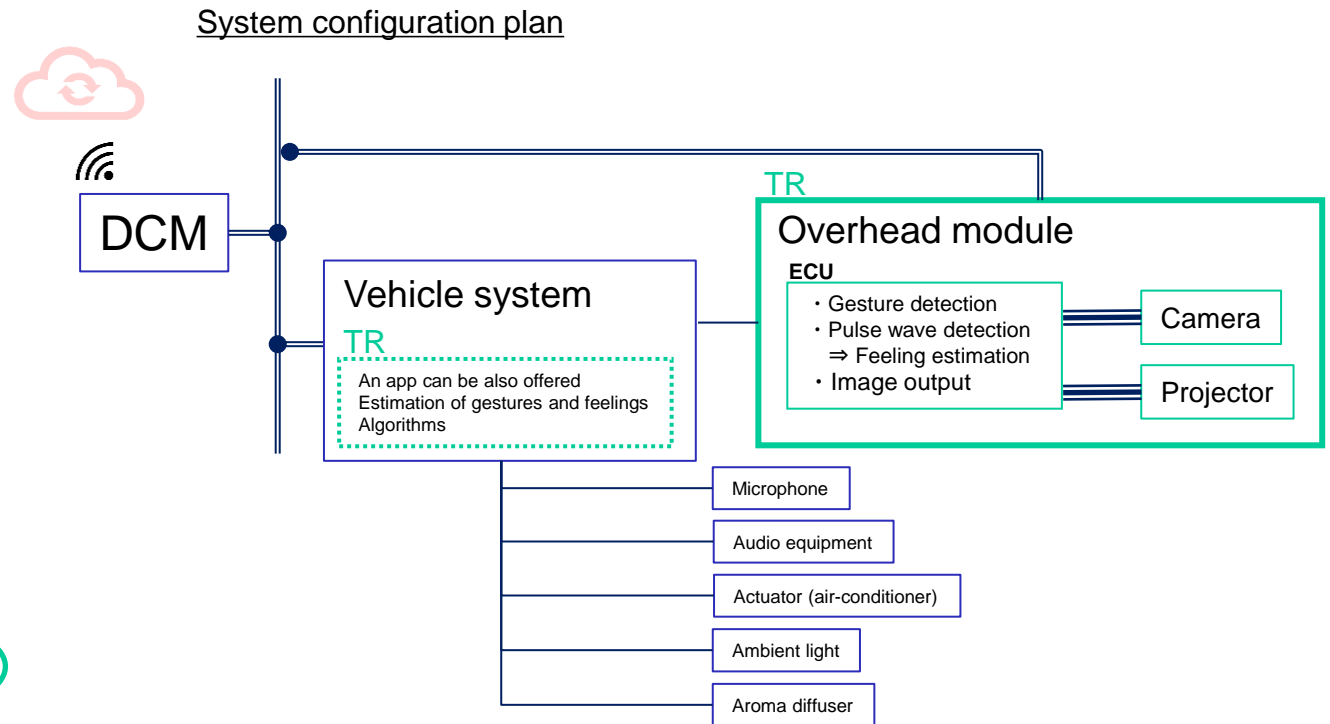
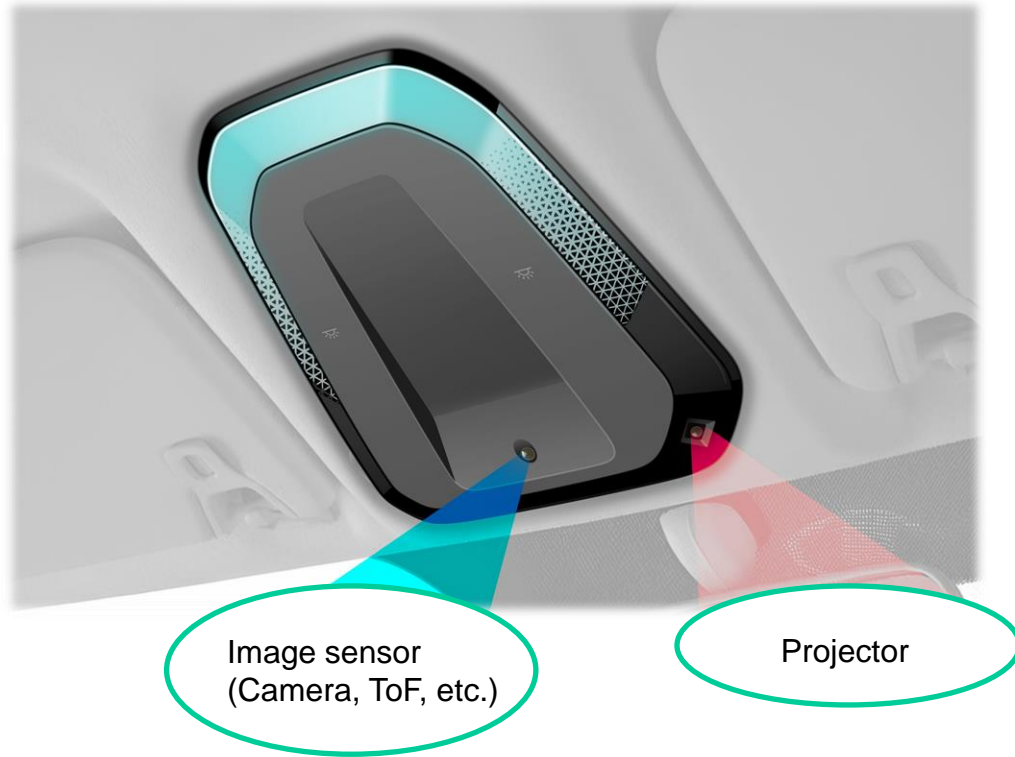
Conventional problem

The current ambience customization and functions are not enough to offer personalized well-being experience in a car.

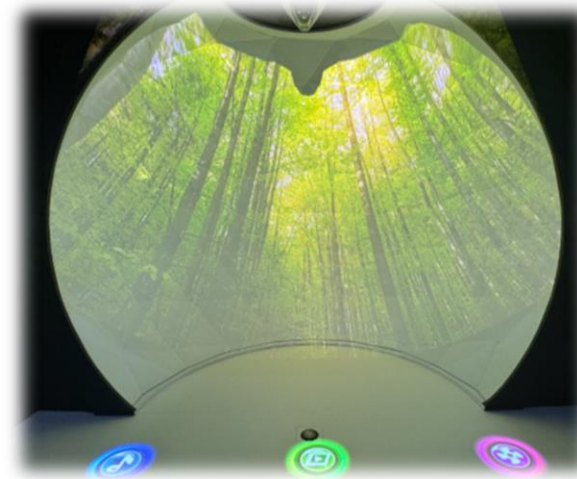


Purposes

- Tokai Rika's original human sensing algorithm enables a personalized well-being experience service with image, sound, light, and aroma.
- Our overhead module incorporating a sensor, algorithms, and device is designed to be installed on the ceiling, the best place for interior sensing.

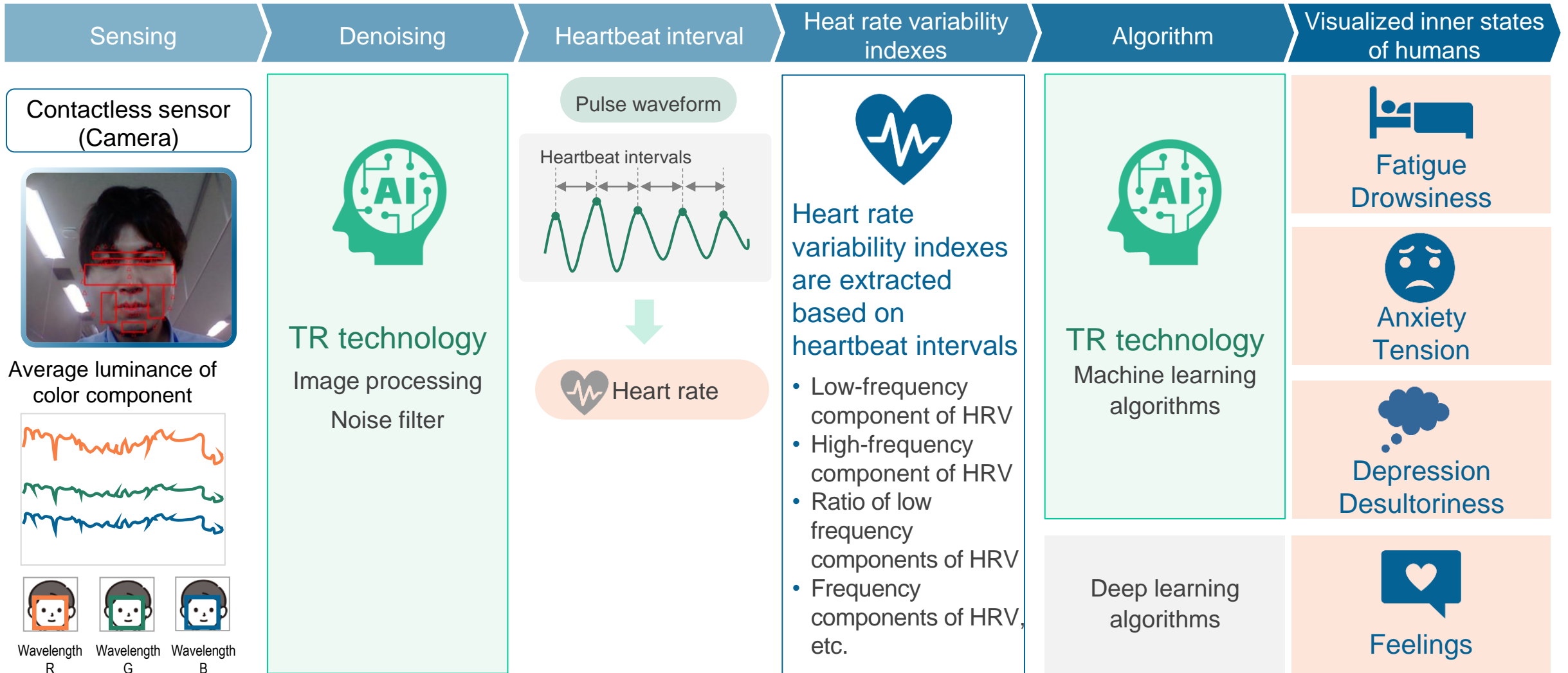


- ① The human sensing technology estimates occupants' feelings to enable to create an optimal ambience.



- ② A combination of natural hands motions, images, and sound enables users to convey their intentions intuitively, a new interaction with cars.





Low-noise pulse waves are extracted from camera images to visualize the diverse inner states of humans by using highly accurate heartbeats.

Image acquisition

Skeleton detection

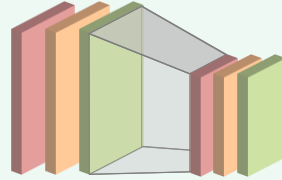
Gesture and motion detection

Application

Camera



The coordinates of joint points are estimated.



- Deep learning
- The optimum hardware realizes high-speed processing.



TR technology

Gestures are estimated from the time-series information of the joint points.

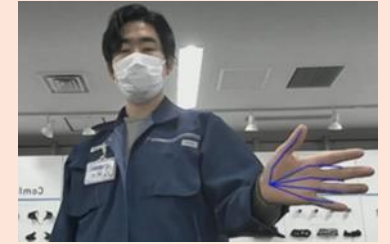
Feature amount is designed from the coordinates of finger joint points.

Rule based/machine learning algorithm

Gestures judgment results



Hand signs



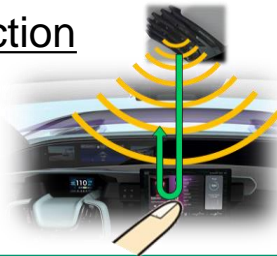
Detection of gestures



Detection of passengers' motions

A ToF sensor is also available for gesture detection

Reflected light from an object
Time measurement → Ranging



Features: Cost saving

Inferior to cameras in detection accuracy



A camera or a ToF sensor can be selected according to the scene of use and to the content of detection.



Deep learning detects humans and their skeletons.

The rule based system and machine learning recognize human gestures from the motions of joint points.

Suggestion of
possible applications



Vital sensing × image × aroma × sound



Gestures × image × sound