PRODUCT

The *Asaphus Face Recognition Library* is a gaze-estimation, and face-identification software that is optimized for deployment in embedded systems. It offers an API for 3D head position and orientation, eye state, eye gaze, and identification.

The *Asaphus Face Recognition Library* is based on deep-learning technology; it is extremely efficient and fully self-contained. It runs at high frame rates on ARM A7, A8, A9 and other embedded processors with virtually any operating system. The software supports single and dual near-infrared cameras with VGA or higher resolution. It supports a wide range of camera mounting positions and is robust against varying head poses, bright daylight, and partial occlusions.

01 HEAD POSE AND EYE STATE

- Head pose in 3D world coordinates;
- Head orientation as rotation matrix and Euler angles;
- Eye state (open or closed);
- Eye state at 30 FPS on single-core ARM A9 @ 600 MHz;
- Faces are tracked from -90° to +90° yaw and pitch > -30°.

02 EYE GAZE

- Origin and direction of the gaze vector;
- Detection of gaze at pre-defined regions of interest;
- Robust against bright daylight and glasses.

03 IDENTIFICATION

- Registration using 5-10 non-biometric images;
- Face identification of up to 50 registered individuals;
- Detection of impostors;
- Face verification with unlimited user base;
- Identification in 200 ms on single-core ARM A9;
- Robust against head pose, glasses, sunglasses, uncontrolled illumination.

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eXIST Existenzgründungen aus der Wissenschaft

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GRÜNDERWETTBEWERB IKT INNOVATIV

Winner 2014

GEWINNER 2015! WECONOMY START-UPS. UNTERNEHMEN. INNOVATIONEN.

Winner 2015

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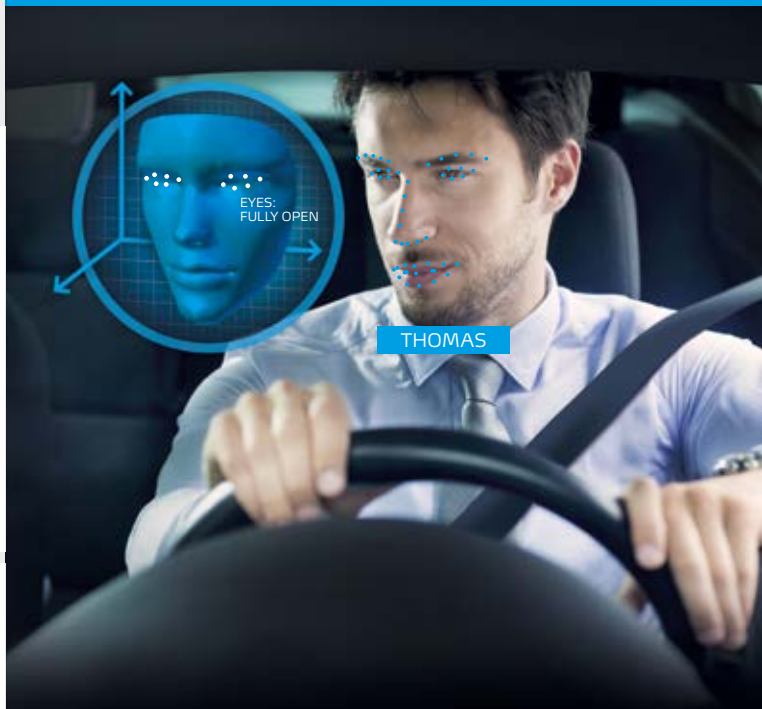
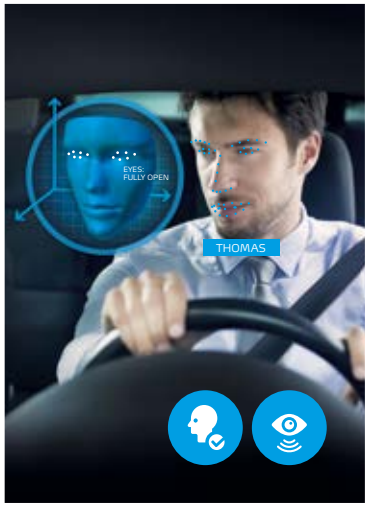
ASAPHUS VISION

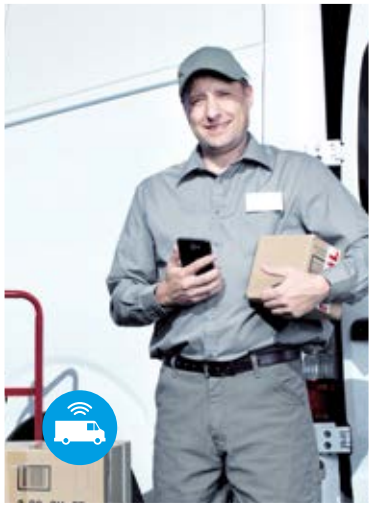
SAFETY, CONVENIENCE, INDIVIDUALITY

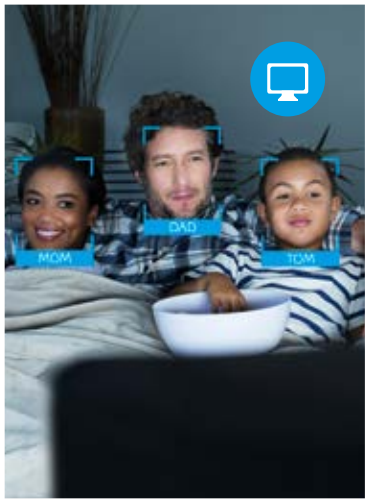


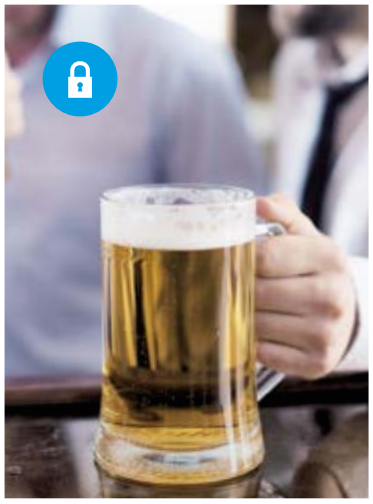
OUR VISION

At Asaphus Vision, we develop software that promotes the safety, convenience, and individuality of its users. We provide our customers with the best-performing and most innovative technology for face identification and gaze estimation on embedded devices. We are a university spin-off and have tight links to the research community.









SOLUTIONS

Driver Identification for Passenger Cars

Offering a perfectly convenient and individual driving experience requires cars to recognize their driver. Driver identification allows the vehicle to adapt its settings to the driver, and to limit both vehicle performance and access to personal information for unknown drivers.

The *Asaphus Face Recognition Library* allows automotive suppliers to integrate driver identification functionality into their driver-monitoring systems. The *Asaphus Face Recognition Library* can be delivered for any development toolchain and operating system, and for single or dual near-infrared cameras. We optimize the library for specific hardware platforms and provide close support during product integration.

Autonomous Driving

Implementing level 2 autonomous driving safely requires the vehicle to monitor the driver's alertness and ability to intervene at any time. For safe level 3 autonomous driving, vehicles are required to monitor the driver's attentional state and ability to intervene with limited lead time. Level 4 vehicles need to manage a safe handover from automomous to manual driving.

The *Asaphus Face Recognition Library* determines the driver's head pose, eye state, and eye gaze at high frame rates and with minimal requirements on computational resources. It provides basic building blocks for the most cost-effective, accurate, and highly-available driver-monitoring systems. We customize the library for any optical path, development toolchain, and computing hardware, and provide close support during product integration.

Commercial Vehicles

Facial identification provides a line of defense against the theft of delivery and vocational vehicles that is robust against possible negligent behavior of drivers. Driver distraction and drowsiness detection software can help fleet operators reduce the risk of accidents as well as insurance costs. The *Asaphus Face Recognition Library* can be embedded into existing telematics hardware. The software provides building blocks for the most cost-effective, accurate, and highly-available driver-monitoring and identification systems.

Appliances

In order to offer the best possible user experience to each individual user, TV sets and other household appliances have to be aware who is using them. The *Asaphus Face Recognition Library* allows appliances to offer personalized recommendation, settings, and levels of user guidance. The *Asaphus Face Recognition Library* runs on a wide variety of embedded processors – such as an M4, A8, and A9 – and works under Linux, QNX, and any other operating system. It recognizes registered users and tracks their direction of gaze.

Ignition Interlock Devices

By verifying that a breath test is in fact taken by the registered user, facial recognition can improve road safety and eliminate the effort that today is spent on manual inspection of images. The *Asaphus Face Recognition Library* identifies users quickly on a wide variety of embedded processors – such as an M4, A8, and A9 – and works under Linux, QNX, and any other operating system. It determines calibrated identification probabilities and allows the system to adhere to defined false-positive rates. It can be integrated into existing systems that are equipped with a camera by way of a firmware update.