As vehicles and mobile technologies become more capable and complicated, we struggle as human beings to integrate the two. On one hand, we love our technology, especially on the go. On the other, we're distracted, overwhelmed, and sometimes exhausted by it, particularly when we're engaged in complex tasks like driving.

What’s the answer? It’s certainly not removing technology from our vehicles. Manufacturers depend on it to improve safety, convenience, and functionality, as well as to differentiate their products. Consumers used to a connected lifestyle at home and work demand the same between home and work — and everywhere else they go.

At KeyLemon, we believe the solution hinges on making complex technology — wherever it’s found — so easy and seamless to use that it fades into the background. To understand how we do that in automotive applications, let’s start by looking at today's drivers and some of the problems they face.

**Existing Challenges**

**Today's drivers are distracted.** Right now, about 660,000 motorists across the U.S. are using phones or other gadgets while speeding along. Others are adjusting seats, mirrors, radio stations, or climate controls. Still others are doing those things while settling disputes between children in the backseat or fumbling with the bagel that just fell, cream cheese down, into their lap. All of them are three times more likely to be involved in an accident.

**Today's drivers are overwhelmed.** Buy a new car today and you’re likely to get built-in GPS. Perhaps satellite radio. Maybe even Facebook, Twitter, and Yelp, right on the dashboard. And you’ll certainly get myriad options for seat position and comfort, climate control, mirror adjustment, air bag activation, and more. It’s all very convenient and popular with car buyers. It’s also a lot to deal with when you’re zipping down the road at up to 75 mph.

**Today's drivers are tired.** As Ferris Bueller would tell you, life moves pretty fast. Keeping up means staying up too late for too many of us. And the resulting fatigue, according to the National Highway Traffic Safety Administration, is responsible for more than 100,000 accidents each year in the US.

**KeyLemon Solutions**

KeyLemon technologies address the distraction, overload, and fatigue of today’s private and commercial drivers with rapid, accurate face identification and tracking, state-of-the-art voice recognition, and advanced motion detection and analysis. Here's a brief rundown of how these technologies work and how they can serve as the foundation for a safer and more comfortable driving experience:

**KeyLemon Technology Lets Drivers Focus on Driving**

KeyLemon’s face recognition technology uses inexpensive in-cabin cameras to identify drivers and occupants in 90 milliseconds or fewer, making that data quickly available for preset seat, steering wheel, and mirror positioning, as well as for setting preferred climate, entertainment, and other options. Simply put, when a driver sits down in a vehicle using KeyLemon technology, the vehicle almost instantly becomes their vehicle, without any effort — or distraction — on their part.

To handle the various lighting conditions present in vehicle cabins, KeyLemon face recognition technology scales and photometrically normalizes incoming multi-resolution face data before handing the information to an advanced neural network that continually learns and tunes itself for optimal recognition time and superior accuracy in all environments.

The result is a highly reliable solution that's also, thanks to a multi-platform SDK and cloud-based implementation, easy to integrate with existing cabin control and customization systems.

**KeyLemon Technology Makes Vehicles Simpler (and Safer) to Operate**

As technology invades the dashboard, so does complexity, despite countless hours (and dollars) spent on human-machine interface studies and UI/UX optimization. But with KeyLemon technology, manufacturers can leverage cutting-edge voice recognition and motion detection and analysis technology to dramatically improve the way we interact with our vehicles.

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Visteon Engineers Advanced Vehicle Cockpit, concept with KeyLemon Face ID Technology
When a vehicle knows who’s driving it, driver statistics can be captured, which can later help a service department quickly diagnose problems due to erratic driving. Driver data may also allow insurance companies to reduce premiums for safe drivers. And using KeyLemon’s advanced motion detection and tracking, manufacturers can now develop and integrate complete gesture control systems more easily and affordably than ever before, helping drivers focus on the task at hand and making the roads safer for everyone, in addition to improving the fluidity and fun of driver-vehicle interaction.

**KeyLemon Technology Monitors Driver Condition and Attention in Real Time**

When drivers tire, accidents happen. KeyLemon technology continually evaluates head and neck position, as well as eye blink frequency and duration, and makes that data available for audible and/or heads-up driver and passenger alerts.

KeyLemon technology also features 20-point facial analysis which is so sensitive and accurate that it not only dramatically improves identification accuracy but can actually detect a driver's emotional state. With real time data this detailed, manufacturers have a wide range of new options for generating alerts or even altering car behavior for potentially compromised motorists.

**Benefits**

By integrating KeyLemon technologies into their vehicles, automotive manufacturers get a wide array of functional, operational, and competitive benefits, including:

- Robust, reliable driver and passenger identification in most lighting conditions
- Low memory and CPU utilization
- Less dependence on costly sensors, such as passenger seat occupancy sensors
- Quick detection of inattentive, tired, or otherwise compromised drivers
- Efficient, platform-neutral system integration
- Affordable and effective brand/model differentiation
- Easy-to-leverage foundation for complete gesture control systems
- Accurate driving behavior monitoring for faster diagnosis and resolution of service issues

Drivers also benefit from KeyLemon technology:

- Automatic configuration of seats, mirrors, radio presets, climate controls, and more
- Easy, intuitive, and hands-free control of multiple cabin technologies
- Audio/heads-up alerts for drowsiness, inattention, and other behavioral hazards
- Keyless, highly secure vehicle entry and operation
- Faster service issue resolution due to driver-level data capture
- Customizable data capture for monitoring teen and inexperienced drivers
- Lower insurance rates for vehicles with advanced driver attention monitoring and responses

**Why KeyLemon?**

Protecting the interests of more than 3 million registered users, KeyLemon specializes in powerful face recognition and speaker verification technologies. With KeyLemon, personal information and sensitive data are fully safeguarded by the individual features of your face and voice. Our unique combination of face and speaker recognition technology can easily be integrated into any system or application to deliver seamless, secure and convenient access to devices, online services and financial transactions. Furthermore, our advanced detection capabilities can be beneficial to organizations providing online education and training, marketing services, as well as enhancing safety features in machinery such as automobiles.