



VEHICLE-TO-VEHICLE AUDIO, VIDEO AND DATA SHARING



DARE TO TRY

Jaguar Land Rover has built a custom vehicle-to-vehicle communications system that can be used in remote areas or off-road conditions to share vehicle network data and even stream multimedia content.

THE CONTEXT

Dedicated short-range communications (DSRC) is the next-generation communications system for the 'connected' vehicle. It is designed to provide direct vehicle-to-vehicle (V2V) communications thus enabling vehicles to share generic 'heart beat' and safety (braking, for example) information.



THE INNOVATION

Jaguar Land Rover sought to extend the DSRC channel to send custom V2V messages, thus enabling the system to share additional vehicle network data and also stream multimedia content. Since the DSRC V2V communications mechanism does not require any external infrastructure or network, the application can be particularly useful in off-road conditions and remote areas where there is no mobile coverage.



For example, the custom V2V message system could allow a lead vehicle in an off-road convoy to share a multitude of useful data such as wade depth, suspension height and vehicle set-up data with the other vehicles in the convoy. It could even stream live videos of the terrain to other vehicles. Alternatively, it could be used by a race car to live share its cornering speed or lateral/longitudinal acceleration or other data with another car on the track.

The project has also enabled the sharing of the vehicle network (CAN) data over a mobile network. This is done using vehicle-to-cloud (V2C) technology, thus allowing the vehicles to continuously and seamlessly share data even when they move outside the DSRC reception range. (The DSRC communication range varies depending upon the landscape but a line-of-sight communications of half a kilometre can be usually achieved.) The company has applied for a patent to protect this innovation.

KEY CHALLENGE

TO ENABLE THE DSRC SYSTEM TO TRANSMIT LONGER MESSAGES

The DSRC system is only designed to send small discrete packets of information (such as vehicle speed and location). The team therefore encoded a software library and appropriate communication protocol layers to enable the system to deliver messages of any type or length. This was done by compressing the data and splitting it into discrete packets that are of a suitable size and format to be sent over the DSRC channel, and then decompressing and processing them at the receiving end.



Vehicle with forward facing camera
(up to 1/2 km away with line of sight)

See round corner
with video stream
from lead vehicle

Graphical representation of
CAN data from lead vehicle
(throttle, brake, lateral and
longitudinal acceleration)

POTENTIAL IMPACT



Innovations such as the ability to custom share vehicle network data can become USPs that can drive a vehicle's sales and, in turn, boost the company's profits.

