INTEL NEWS FACT SHEET

Intel Demo Fact Sheet

Architecting the Future of Transportation

In transportation, the possibilities that IoT creates are more exciting and the societal benefits are more tangible than in any other industry. With a pervasive set of technologies, innovations and leadership that transcends multiple markets, Intel is uniquely positioned to scale solutions across the automotive industry. To demonstrate this, Intel is showcasing more than a dozen critical and synergistic technologies from across the company's portfolio, which collectively will help the industry realize the promise of safe, secure, fully automated driving.

In-Vehicle Technologies

Each step toward ubiquitous connected and fully autonomous driving brings with it more sensors, more data and more demand on compute in the vehicle. Intel's broad portfolio of power-efficient silicon includes Intel® Xeon® architecture-based automotive processors, field-programmable gate array (FPGA) chips from Altera, and dedicated machine learning accelerators. This scalable and heterogeneous platform enables real-time local compute, edge analytics and a host of systems to support a safer vehicle: data collection, on-board memory, sensor fusion, deep learning, security agility, path planning and layered protection from chip to cloud.

- **BMW 7 Series* and Lincoln MKZ*:** See what it takes to physically instrument an "off the shelf vehicle" to become a Xeon data center on wheels. Intel took a stock production Lincoln MKZ and instrumented it into a self-driving vehicle in less than five weeks. Understand the wide range of sensing capabilities from LIDAR to laser scanners and cameras that it takes to enable a self-driving vehicle. Also, see the fully instrumented BMW 7 Series that serves as the future development and validation platform for Intel and BMW.
- **L4 Virtual Testing Environment:** Intel will showcase its L4 software stack that implements a functional architecture of sensing using LIDAR and various cameras; environmental modeling and planning, including map generation and motion planning; and vehicle actuation in a physical car using the stack.
- **Altera Stereo Vision:** Altera's Programmable Solutions Group's (PSG) field-programmable gate array (FPGA) – essentially a software programmable chip – delivers the ability to quickly process information at the edge. The demo processes data from an in-vehicle camera with computer vision algorithms running on an FPGA showing how far away people or objects are from the car. The data collected can be processed in milliseconds, a critical necessity when assisting the autonomous vehicle to swerve, brake or otherwise avoid pedestrians and other objects.
- **Jaguar F-Pace*:** Built on an Intel® Atom™ automotive SoC, it supplies visually stunning graphics, responsive touch screens and natural voice-based interactions delivering a seamless integration between the instrument cluster and IVI. The currently shipping Intel Atom automotive SoCs allow OEMs to quickly and easily implement a cost effective in-vehicle experience.

Communication

As mobile data traffic surges, connected vehicles will be among the billions of devices competing for network bandwidth. To confidently deploy autonomous driving scoring models, secure over-the-air software updates and entertainment services, transportation providers need data transfer speeds of milliseconds. 5G is the only network technology capable. Intel is leading this evolution, establishing key global partnerships with telecom and automotive leaders to deliver integrated 5G prototype solutions to ensure network readiness and successful early rollouts.

- **Intel 5G Mobile Trial Platform:** To expedite network readiness, Intel has created the 5G Mobile Trial Platform, which contains a host application processor, baseband processing board and an IF board that allows for new modem development. Intel will display its new RFIC (Radio Frequency Integrated Circuit) with an integrated 28 GHz antenna supporting beam forming and beam steering.
- **Bolt Motorbike*:** The future of transportation, and indeed smart cities, is not just about cars but all modes of connected transportation. Using an Intel® Edison compute module, Wind River and Intel are making IoT possible for Bolt Motorbikes – the first electric hybrid motorbike. Just like an autonomous vehicle, Wind River Helix Device Cloud collects and analyzes data from the bike and performs advanced analytics to continuously improve the ride.

Artificial Intelligence and Machine Learning

Connected vehicles collect data at an unparalleled rate, and need to use this data to create deep learning algorithms, manage fleets with precision, construct increasingly detailed high-definition maps, and enable new business models like transportation as a service. This means data needs to be sufficiently stored, shared and protected. No other technology provider can deliver all the components – hardware, software, storage, networking and security – to enable these new use cases.

- **Collaborative Cancer Cloud:** A cloud platform that enables distributed learning over large data sets – a shared challenge with the development and deployment of autonomous vehicles that will similarly generate extremely large data sets that need to be analyzed in the cloud.
- **Computer Vision Technologies:** Showcases the efficiency and scalability of Intel's portfolio across a range of computer vision situations. In this demo you'll see how Intel is "learning by doing" with the development of real algorithms for important use cases crucial to autonomous vehicles.

Human Machine Interface (HMI)

To satisfy the human need to feel safe in autonomous vehicles, an interface that builds confidence between human and machine is needed. It must be compatible with evolving consumer electronics; adapt to individual passenger preferences; safely change course; monitor driver, passenger and pedestrian safety; and communicate alerts. Intel is demonstrating a sophisticated, natural human-machine interface (HMI) through comprehensive research, flexible architecture, advanced graphics capabilities and end-to-end security.

- **Skyline:** This L2/L3 user experience prototyping platform supports design, research and learning about the personal vehicle experiences. It enables rapid iterative development and supports evaluation of UX and UI requirements, natural language understanding, authentication technology, real-time data analytics, and contextual sensor and personal driving assistant development.
- **Leap:** This L4 user experience prototyping platform, for fully autonomous (L4) experiences, incorporates communication and touchscreens, mobile devices, voice, and external vehicle indicators to explore and prototype key fully autonomous experiences.

CONTACT: Jennifer Baumgartner
Jennifer.e.baumgartner@intel.com