

## Patent Insights: Toyota, Ford, Hyundai, GM, Allstate Connected Car Innovations / Internet of Things



### Liquidax Innovation Platform Injections

#### FIRM DESCRIPTION

Liquidax Capital invests in & acquires superior innovations & related intellectual property assets that are poised to dramatically impact global markets over the next 25 years.

As an (AAM) Alternative Asset Management firm sponsoring & managing private equity innovation funds; our focus is on injecting the assets into portfolio companies which can immediately utilize them for market growth, competitive protection & value extraction.

Liquidax portfolio companies consist of public companies operating on global stock exchanges; and/or private companies funded by VC firms.

#### FUND DESCRIPTION

**Liquidax Global Exchange Fund I, LP** is a fund specifically developed for the purpose of investing-in and acquiring advanced (IoT) Technology, Innovation & related Intellectual Property Assets for the benefit of portfolio companies.

Portfolio companies enjoy the benefits of high-quality innovation and highly-correlated patents eliminating the needs for lengthy, high-cost R&D, risky M&A all while allowing immediate benefits & applications without the traditional costs or fees.

#### INNOVATION, IP ASSET & MARKET RESEARCH

In the course of its strategy; Liquidax performs research on companies, markets, innovation, patents, claims, & investments. When we find interesting IP information we like to openly share it with interested parties.

#### Liquidax Research & Analysis:



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## Liquidax™ Global Exchange Funds Private Equity – IoT Innovation & IP Asset Injections

### Patent Insights: Connected Car Innovations

As outlined by PWC; “Worldwide sales of connected car products will increase almost fourfold between 2015 and 2020, adding more than \$149 billion in revenues in the passenger car segment alone. Technologies will offer buyers greater flexibility in personalizing the cars they choose, and enable greater contact between manufacturers and customers strengthening the bonds between them and increasing loyalty to the brand. Consumers are already seeing new capabilities and features in the connected auto markets. The below (5) patents & applications highlight the view and vision of some of the largest auto companies in the world and outline products and services planned for the market.

#### COLLISION AVOIDANCE – TOYOTA

Toyota patent application **US20140005906** illustrates the innovation regarding assisting the human or electronic driver of a host vehicle through predicting the future position and velocity trajectory of a preceding vehicle. The preceding vehicle is a vehicle immediately ahead of the host vehicle, and the dynamic state of the preceding vehicle was predicted based on data received from surrounding vehicles using the V2V (vehicle-to-vehicle) communications. The system allows a more comfortable driving experience in dense traffic environment.

#### AUTONOMOUS DRIVING – FORD MOTOR COMPANY

Ford patent application **US20150241226** illustrates the innovation regarding autonomous vehicle operations such as maintaining a lane in a roadway, maintaining a speed, pulling to a side of a roadway, and bringing vehicle to a stop. The autonomous vehicle obtains data concerning surrounding conditions via sensors included in the vehicle. Sensor data can provide information concerning environmental conditions and edges of a road or lanes in a road. Sensor data also can be used to formulate the appropriate speed for a vehicle and an appropriate path for a vehicle. Ford innovation enables autonomous vehicle operations based on the integrated information that are obtained by several sensors concerning a variety of phenomena. The data can be provided from the remote server or other vehicles using vehicle-to-vehicle communications.

#### TELEMATICS & BIG DATA - ALLSTATE

Allstate patent **US9269202** provides details regarding the connected car telematics business that provides data analytics products to third parties. The telematics system collects vehicle operation data at regular time intervals. The vehicle operation data includes data from on board diagnostic systems and car area network systems (e.g., speed, rate of acceleration, activation of brakes, degree and duration of steering direction, etc.) and other monitoring systems (e.g., presence and distance of objects behind or ahead of the vehicle, driver physiological status, etc.). The collected data transferred to the remote data processing system. The remote data processing system creates databases for evaluating driver behavior or operation characteristics (e.g., aggressiveness, recklessness, compliance with laws, etc.). The processed data can be provided to third parties (e.g., insurance companies, lending institutions, car rental companies, product and service marketing companies, potential employers, etc.) to evaluate an individual's driving behavioral characteristics in a real life.

#### SMART HOME CONVERGENCE WITH VEHICLE NETWORKS – HYUNDAI

Hyundai patent application **US20120120930** illustrates a vehicle network system interconnected with a home network that includes a vehicle information collection unit and a wireless transceiver unit. The vehicle information collection unit detects accident information or management information of a vehicle and the wireless transceiver unit transmits information detected by the vehicle information collection unit to the home network via a wireless communication network and is configured to receive a response signal from the home network. The home network performs various functions such as providing an image of the inside of a home or a residential area; monitoring and controlling water, electricity, lighting and room temperature; controlling electronic devices configured to perform communication; inspecting a door, a window and a gas and electricity sensor inside the home; detecting an arrival of a parcel or a guest; and collecting elevator information. When the vehicle network system is detected within the predetermined range, the home network transmits parking information with respect to the vehicle equipped with the vehicle network. The transmitted parking information can then be displayed on the display unit in the vehicle.

#### ARTIFICIAL INTELLIGENCE (AI) DRIVER ASSISTANCE – GENERAL MOTORS (GM)

GM patent application **US20150302718** illustrates a system for correlating physiological signals associated with a driver with vehicle-related events using machine learning techniques. Physiological signals include sensed and monitored data regarding the heart-rate, oxygen use, eye motion, galvanic skin response, blood flow, pupil dilation, and facial expression. Vehicle-related events include traffic, weather, visibility, road conditions, accidents, traffic alerts, distance-from-other vehicles. Vehicle-related events can be determined and communicated through external sources (e.g., cloud-data, inter-vehicle communication) as well as the vehicle's controller-area network. Based on the vehicle event data and physiological data, a driver state is then determined by correlating the vehicle event data with the physiological data associated with the driver using the machine learning. The driver state includes a level of driver stress, a level of driver drowsiness, a level of fear of the driver, a state correlated to the event of overtaking another driver, and a state correlating to the event of being overtaken by another driver. The system provides a suggested action based on the state of the driver. For example, the system determines that the driver becomes angry or nervous when in heavy traffic. The system then suggests to the driver that the channel on the audio system be changed to provide relatively soothing music.

#### IMPORTANT IP ASSET DISCLOSURE:

Liquidax is sharing this information because it is interesting to us and we wanted to share with those interested in IoT, technologies and patents. We DO NOT own any of the IP referenced in this brief. We are not suggesting any value for the IP referenced in this brief; and we are not endorsing or making any opinion to the success or failure of any IP referenced in this brief.

#### IMPORTANT INVESTMENT DISCLOSURE:

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