How Automotive OEMs and IVI (In-Vehicle Infotainment) sector benefit from iRobo automated testing?

Product-based companies and OEMs in automotive, consumer electronics, wearable technologies or connected devices often face challenges to deliver high quality products with better user experience, at optimal costs, and within competitive development timelines. These combined objectives can only be achieved by leveraging a well-designed QA and utilizing a robust end-to-end automated testing that is scalable and independent of the device's OS platform.

Consider product with any of the OS platforms such as Android, iOS, Qt, Linux, Arm, their variants etc. Your product's ideal end-users are the real loyal consumers who will use your product physically in practice. It totally make sense to get those tested beforehand also using physical touch inputs like a human, instead of just using emulators or simulated signals.

Testing device physically covers entire software branches between the touchscreen and the operating system and trigger is done via real sensors (e.g., touch-screen, gravity-sensor).It activates the actual hardware components of device under test, such that Memory leaks and Crashes gets detected quickly already during earlier phase of testing..

At Infiniteq, we help customers create better quality products using solution iRobo. iRobo utilizes an intelligent robotic arm that performs gestures like human and is guided by advanced machine vision algorithms which constantly monitors the screen events and lists down critical software defects and help significantly to achieve better product quality and user experience.

In this section of article, we describe how the automotive sector can benefit from iRobo automated testing based on our experiences with various projects with connected solution players and OEMs.

In-Vehicle Infotainment (IVI) systems are becoming a more significant part of the overall user experience in vehicles. When sitting in a new car for the first time and after sensing the first feeling from interior, one tends to seek the display at hand wondering what happens if I turn it on.

The first moments spent in navigating between different menu items and watching the changing graphics will determine whether the user gets a feeling of quality or not. Usually that feeling, the first impression applies to the whole car. Responsiveness, low latency, logic and graphic quality are the things that simply needs to be there for ensuring the quality experience.

While it is important to be open for different approaches when automating the software testing of systems like IVI, it is crucial to consider how it's being actually used by the end user in the real life scenarios when the product is finished and placed in a vehicle. In practise this means that while device is being tested, it should have the same hardware and software versions than in final setup having no additional components or software. Also no additional cables should be plugged in as it might affect to the system functionality.

When testing IVI system automatically, accurate physical touch inputs with controlled pressure and speed combined with constant display monitoring with intelligent machine vision algorithms is the best way for reaching the authentic usage of the device. At the same time it is the best way for finding the most critical software defects that might spoil the user experience when left hidden in a system due to inadequate test approach.

iRobo is a tool that is proven to achieve this while interacting with the IVI system as a real end user.

Ideally the test setup would contain multiple iRobo units for controlling multiple IVI systems having different hardware and software variants or running different test sets for reaching the maximal test coverage. In addition each iRobo unit would control simultaneously one or more smart devices being connected to IVI system for testing different connectivity use cases.

Create better connected products

Automated testing with iRobo gives you the advantage when creating and continuously improving connected products.

✓ Save time and effort, faster testing

Faster automated testing which covers and explores entire functionality of a product, uninterrupted 24/7 allowing you to save weeks of time and money.

✓ Better Test Coverage

Utilizes intelligent heuristics and coverage parameters to maximise the breadth and depth of testing which improves test coverage and helps to find software defects and issues before your customers find them. You can rapidly test more devices and more product functions to ensure optimum performance.

✓ Find hidden bugs earlier, get best results

Hidden bugs gets revealed earlier due to the detailed testing of each and every functionality of connected products with high repetition and various other patterns of testing offered by iRobo.

Automotive Test Setup
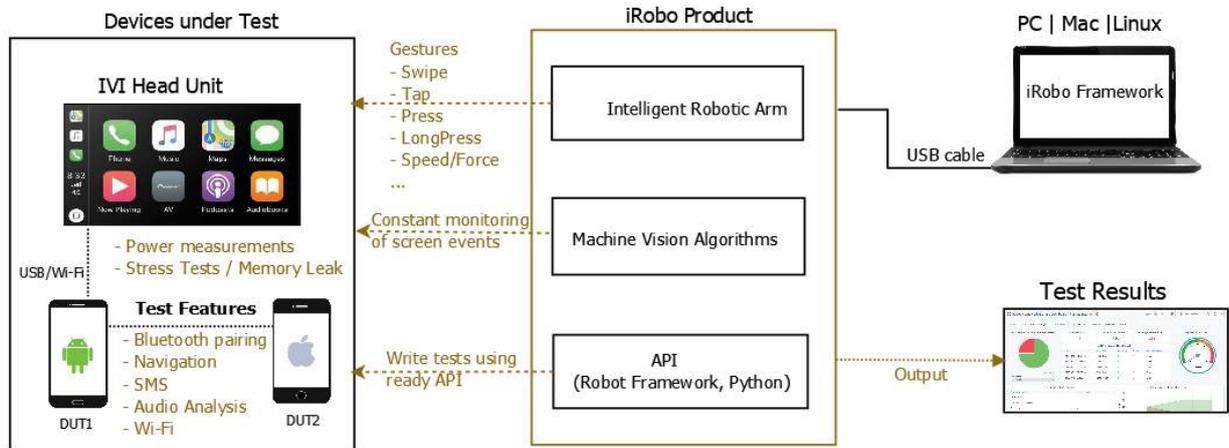
✓ **iRobo offers flexible test setup with ready API, sample tests and documentation.**

Innovative solution for testing interoperability and connectivity

Bluetooth connectivity | Voice call connectivity | Wi-Fi / Cellular network connectivity

Our fast, reliable and cost-effective automated interoperability testing helps businesses create better connected products. There are multiple end-to-end connectivity related concerns when developing a product that is robust and is compatible with devices and networks from various other manufacturers. For example: IVI Bluetooth connectivity, it is crucial that Bluetooth remains connected and thus shall be tested with all types of connected devices (Phones, Smartwatches) with different OS platforms for its connectivity. iRobo solution is a perfect tool designed to test all these end-to-end connectivity issues from the beginning.

On-premise automated testing

When device under testing requires occasional manual interaction, test proceedings needs to be monitored live or operating test execution through external server is not an option due to security reasons, on-premise test setup is the optimal solution. Also when a single hardware robot is used for testing multiple test devices that needs to switch from time to time, on-premise test setup is often the best way to go forward.

Cloud-based automated testing

Cloud-based test setup is a logical approach when the test team is mainly working remotely, the number of used hardware robots is high creating a demand for certain test facilities or when a single hardware robot is used for testing a single test device and the physical setup maintenance need is low.

Perfect test tool for Android auto / CarPlay Infotainment platforms

Apple CarPlay and Android Auto are in-car assistant systems that let you access certain features of your phone, straight from the car's dashboard. With these systems you can do a variety of things like display turn by turn navigation, play music or check your messages using voice commands or by tapping buttons in your car.

With iRobo you can test complex interactive scenarios involving IVI head units and other connected devices.

Test Farm, scale setup rapidly

Our solution is compact, silent and efficient such that it fits in any confined space without need of any dedicated lab spaces, shock absorbing tables or any particular safety shields around it. You can stack multiple iRobo units in a cabinet and control it locally or from any distributed locations.

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