sequality SOFTWARE ENGINEERING

Sequality Automotive UX

Qt Open Source Software Suite for Embedded Linux

Sequality offers an automotive software suite based on the framework Qt, taking advantage of the latest technology available. Emphasis is put on a seamless integration of high-quality graphics for 2D and 3D visualization. In combination with the hardware (e.g. NXP i.MX 6, NXP i.MX 8 or Nvidia Tegra compute modules), which makes use of OpenGL hardware acceleration, a fluid and snappy user experience with a constant 60 frames per seconds (FPS) on the display is achieved.

The solution reflects sequality's approach on how to handle multi-display user interfaces: Either the solution uses a dedicated CPU and GPU for each separate screen to maximize security, or a multi-display software window-manager is used, which runs both screens on the same CPU and GPU. In any case, inter-process communication is performed by a standard socket-based communication (encrypted WebSocket JSON data stream) that is open to extensions and individual, tailor-made vehicle customizations. Sensor data from the vehicle can be integrated via CAN-Bus (e.g. SAE J1939) via predefined automotive protocol connectors, which are provided by sequality upon request within the automotive UX framework.

Detailed information and video at https://www.sequality.at/en/solutions/automotive-off-highway/

Hardware

- NXP i.Mx 6, NXP i.Mx 8 or Nvidia Tegra Module
- Optional: Intel NUC i3 with Intel Iris Pro 955 Graphics

Software

- Sequality Automotive UX
- Embedded Linux based on Yocto or Buildroot
- Also runs on Windows 10, Ubuntu 18.04 or Android / iOS
- Qt Open Source Edition 5.13

Contact

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Benefits

- Sequality Automotive is a ready-to-use Qt framework for prototyping and for new high-potential concept cars.
- Create fast user interface prototypes for electric vehicles, trucks, infotainment & navigation systems.
- Migrate existing legacy user interfaces to the Qt platform
- Create high volume products based on Qt via either a commercial or Open Source licence.

Demonstrator Features

- Digital cockpit & instrument cluster shows speed and RPM gauge. High-quality, transparent background graphics are mixed with 3D navigation content.
- The infotainment system shows
  - vehicle-overview with 2D graphics
  - statistics data with a line chart and 6 separate values
  - navigation with text-input, history data and favourites
  - a music page with album visualization and song list
  - a settings page with language selection and other features
- All graphics are rendered by hardware accelerated OpenGL by the graphics processor unit (GPU), ensuring a fluid 60 frames per second (FPS) for the best user experience.
- Virtual keyboard in multiple languages for text input
- Navigation data in 2D and 3D. The map data can be visualized with several layers and is optimized for ideal information content with minimal distraction.
- Multi touch interaction on both displays. Zooming, rotation & swiping gestures are supported.