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How to make friends with strangers QML OpenGL context. Part III: Processing user input tutorial

Qt *, C ++ *, Programming *

In this article I will try to tell you about how to send mouse and keyboard events in [QQuickWindow](#) , when used in conjunction with [QQuickRenderControl](#) . The reason that it is necessary to pay special attention to, is that in the case of [QQuickRenderControl](#), no window is not actually created, respectively, in [QQuickWindow](#) there is absolutely no possibility of getting any particular event, and must be emulated. The same goes for resizing - about this operation as necessary to notify explicitly.

For those who missed the previous parts:

- [Part I](#)
- [Part II](#)

How initsiiruyutya events in Qt

Sending events in Qt by using the method

```
bool QCoreApplication :: sendEvent (QObject * Receiver, QEvent * Event)
```

where

- receiver - recipient of the message, in this case, a copy of [QQuickWindow](#) (or its descendants);
- event - an instance of a particular type of event;

Transmission of mouse events

For correct functioning enough to realize three mouse events: `QEvent :: MouseButtonPress`:

```
QPointF mousePoint ( 150 , 201 );
Qt :: MouseButton button = Qt :: LeftButton;
Qt :: MouseButton buttons = Qt :: LeftButton | Qt :: RightButton;
Qt :: KeyboardModifiers modifiers = Qt :: AltModifier;
QMouseEvent mouseEvent (QEvent :: MouseButtonPress, mousePoint, mousePoint, button, buttons, modifiers);
QCoreApplication :: sendEvent (quickWindow, & mouseEvent);
```

where

- mousePoint - current mouse position coordinates [QQuickWindow](#);
- button - the mouse button caused the event;
- buttons - all mouse buttons are pressed at the time of generation of the event;
- modifiers - pressed on the keyboard modifier keys (Ctrl, Alt, Shift, etc.);

mousePoint used twice, the first time since the transmitted coordinates [QQuickWindow](#), second time in screen coordinates. But because: a) the window at the not created, b) always treated as top-level window, c) his position we manage yourself - pass the same value (as if the window is always in the top left corner of the screen), and when a position of the window, just this fact will be taken into account.

`QEvent ::MouseMove`:

```
QPointF mousePoint ( 170 , 198 );
Qt :: MouseButton button = Qt :: NoButton;
Qt :: MouseButton buttons = Qt :: LeftButton | Qt :: RightButton;
Qt :: KeyboardModifiers modifiers = Qt :: AltModifier;
QMouseEvent mouseEvent (QEvent :: MouseMove, mousePoint, mousePoint, button, buttons, modifiers);
QCoreApplication :: sendEvent (quickWindow, & mouseEvent);
```

Since the cause of the event the mouse movement is the fact of the movement of the mouse, rather than any of the buttons, button variable is set to `Qt :: NoButton`.

`QEvent :: MouseButtonRelease`:

```
QPointF mousePoint ( 160 , 251 );
```

```

Qt :: MouseButton button = Qt :: LeftButton;
Qt :: MouseButton buttons = Qt :: RightButton;
Qt :: KeyboardModifiers modifiers = Qt :: AltModifier;
QMouseEvent mouseEvent (QEvent :: MouseButtonRelease, mousePoint, mousePoint, button, buttons, modifiers);
QCoreApplication :: sendEvent (quickWindow, & mouseEvent);

```

button in this case means the button is the cause of this event, but in this case it was released, respectively, in the buttons, it can no longer be present (otherwise Qt starts to process this event is not true).

Transfer of key events

Similarly, for the correct processing of keyboard events, it is enough to realize the 2 events: QEvent :: KeyPress:

```

Qt :: Key qtKey = Qt :: Key_Space;
QKeyEvent keyEvent (QEvent :: KeyPress, qtKey, Qt :: NoModifier);
QCoreApplication :: sendEvent (quickWindow, & keyEvent);

```

QEvent :: KeyRelease:

```

Qt :: Key qtKey = Qt :: Key_Space;
QKeyEvent keyEvent (QEvent :: KeyRelease, qtKey, Qt :: NoModifier);
QCoreApplication :: sendEvent (quickWindow, & keyEvent);

```

Resizing

As already is mentioned above, offscreen windows in Qt traktutsya as top-level window, so use the appropriate method:

```

QSize newSize ( 320 , 240 );
quickWindow-> setGeometry ( 0 , 0 , newSize.width (), newSize.height ());

```


In addition to changing the size of the actual window, preferably just resize the FBO, because otherwise obtain or pixelation (with increasing size) or wanton use of resources (because the size of the FBO will be more than required):

```

if (context-> makeCurrent (offscreenSurface)) {
    destroyFbo ();
    createFbo ();
    context-> doneCurrent ();
}

```

Since it is impossible to change the size of FBO, simply remove the current and create a new (see. The items in [Part I](#)). That's all. Examples of implementation, as usual, is available on [GitHub](#) Well, as always, comments, questions, healthy criticism - welcome. *Continued should ...*

 Qt5, Qt Quick, QML

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