

Keyboard, Mouse, Idle

Thumrongsak Kosiyatrakul
tkosiyat@cs.pitt.edu

Keyboard Callback Functions

- As we discussed earlier, the `glutKeyboardFunc()` function can be used to set the callback function which will be called whenever a keyboard event is generated.
- The signature of the `glutKeyboardFunc()` function is as follows:

```
void glutKeyboardFunc(void (*func)(unsigned char key,  
                                int x, int y));
```

where

- `key` is the character associated with the keyboard event,
- `x` is the x-coordinate of the mouse pointer, and
- `y` is the y-coordinate of the mouse pointer.

Example

- The following is an example of a keyboard callback function:

```
void keyboard(unsigned char key, int mousex, int mousey)
{
    if(key == 'q')
        exit(0);
}
```

- The above function will terminate the program if a user press the 'q' key. Otherwise, it simply does nothing.
- For Esc, Backspace, and Delete keys, use values 27, 8, and 127, respectively.
- Note that special keys such as function keys (F1, F2, ...), arrow keys, page up, page down, etc are not part of the `glutKeyboardFunc()` function.

Special Keyboard Callback Functions

- To handle special keys, the `glutSpecialFunc()` function is used to set the callback function.
- The signature of the `glutSpecialFunc()` function is as follows:

```
void glutSpecialFunc(void (*func)(int key, int x, int y));
```

where

- `key` is the special key associated with the keyboard event,
- `x` is the x-coordinate of the mouse pointer, and
- `y` is the y-coordinate of the mouse pointer.

Special Key Identifiers

Use the following identifier to refer to a special key:

Identifier	Special Key	Identifier	Special Key
GLUT_KEY_F1	F1 function key	GLUT_KEY_LEFT	Left directional key
GLUT_KEY_F2	F2 function key	GLUT_KEY_UP	Up directional key
GLUT_KEY_F3	F3 function key	GLUT_KEY_RIGHT	Right directional key
GLUT_KEY_F4	F4 function key	GLUT_KEY_DOWN	Down directional key
GLUT_KEY_F5	F5 function key	GLUT_KEY_PAGE_UP	Page up directional key
GLUT_KEY_F6	F6 function key	GLUT_KEY_PAGE_DOWN	Page down directional key
GLUT_KEY_F7	F7 function key	GLUT_KEY_HOME	Home directional key
GLUT_KEY_F8	F8 function key	GLUT_KEY_END	End directional key
GLUT_KEY_F9	F9 function key	GLUT_KEY_INSERT	Insert directional key
GLUT_KEY_F10	F10 function key		
GLUT_KEY_F11	F11 function key		
GLUT_KEY_F12	F12 function key		

Esc, Backspace, and Delete keys are generated as ASCII character which is handled by the `glutKeyboardFunc()` function

Mouse Callback Functions

- The process events generated by a mouse, use the `glutMouseFunc()` function.
- The signature of the `glutMouseFunc()` function is as follows:

```
void glutMouseFunc(void (*func)(int button, int state,  
                                int x, int y);
```

- button can be either `GLUT_LEFT_BUTTON`, `GLUT_MIDDLE_BUTTON`, or `GLUT_RIGHT_BUTTON`
 - For the scroll wheel:
 - scroll up, button will be 3
 - scroll down, button will be 4
 - state can be either `GLUT_UP` or `GLUT_DOWN`
 - x is the x-coordinate of the mouse pointer, and
 - y is the y-coordinate of the mouse pointer.
- Note that when a user click a button, two events are generated, when the button is down and when the button is up.

Mouse Motion Callback

- To capture the location of a mouse pointer while a button is down, use the `glutMotionFunc()` function
- The `glutPassiveMotionFunc()` function is used while no mouse buttons are pressed
- The signatures as as follows:

```
void glutMotionFunc(void (*func)(int x, int y));  
void glutPassiveMotionFunc(void (*func)(int x, int y));
```

- `x` is the x-coordinate of the mouse pointer, and
- `y` is the y-coordinate of the mouse pointer.

Idle Callback Function

- For background processing or animation, use the `glutIdleFunc()` function
- The callback function will be continuously called when there are no events.
- The signature of the `glutIdleFunc()` is as follows:

```
void glutIdleFunc(void (*func)(void));
```