Basic GLUT

Introduction to GLUT function

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- Geometric Object Rendering
- Beginning Event Processing

Document

- https://www.opengl.org/resources/libraries/glut/spec3/spec3.html

The OpenGL Utility Toolkit (GLUT) Programming Interface API Version 3

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Initialization and window

- void glutInit(int *argc, char **argv);
  - Initializing the GLUT library
  - Should be called before any GLUT functions
- void glutInitDisplayMode(unsigned int mode);
  - Specify a display mode for windows created
  - Color: GLUT_RGBA, GLUT_RGB or GLUT_INDEX
  - Framebuffer: GLUT_SINGLE or GLUT_DOUBLE
  - Buffer: GLUT_DEPTH, GLUT_STENCIL and GLUT_ACCUM

Initialization and window

- void glutInitWindowSize(int width, int height);
  - Set the initial window size
- void glutInitWindowPosition(int x, int y);
  - Set the initial window position
  - The actual position is left to the window system to determine
- int glutCreateWindow(char *name);
  - Create and open a window with previous settings

Initialization and window

- void glutPostRedisplay(void);
  - Mark the current window as needing to be redisplayed
  - The window‘s display callback will be called
- void glutSwapBuffers(void);
  - Swap the buffers of the current window if double buffered
  - An implicit glFlush is done by glutSwapBuffers

Callback Registration

- void glutDisplayFunc(void (*func)(void));
  - Put whatever you want to render in the callback
  - The callback is called when the window need to be redisplayed
  - Call glutPostRedisplay() to trigger the callback
- void glutReshapeFunc(void (*func)(int width, int height));
  - The callback is called when a window is created, resized or moved
  - Always call glViewport() to resize your viewport
- void glutIdleFunc(void (*func)(void));
  - Perform background processing tasks or continuous animation when window system events are not being received
  - The idle callback is continuously called when events are not being received

Callback Registration

- void glutKeyboardFunc(void (*func)(unsigned char key, int x, int y));
  - Each key press generating a keyboard callback
  - key: The ASCII character generated by the pressed key
  - x and y: The mouse location in window relative coordinates when the key was pressed
- void glutMouseFunc(void (*func)(int button, int state, int x, int y));
  - Each press and each release mouse button in a window generates a mouse callback
  - button: GLUT_LEFT_BUTTON, GLUT_MIDDLE_BUTTO or GLUT_RIGHT_BUTTON
  - state: GLUT_UP or GLUT_DOWN
  - x and y: The mouse location in window relative coordinates when the mouse button state changed

Callback Registration

- void glutMotionFunc(void (*func)(int x, int y));
  - The callback is called when the mouse moves within the window while any mouse buttons are pressed
  - x and y: the mouse location in window relative coordinates
- void glutPassiveMotionFunc(void (*func)(int x, int y));
  - The callback is called when the mouse moves within the window while no mouse buttons are pressed
  - x and y: the mouse location in window relative coordinates

Geometric Object Rendering

- void glutSolidSphere(GLdouble size); void glutWireSphere(GLdouble size);
- void glutSolidCube(GLdouble size); void glutWireCube(GLdouble size);
- void glutSolidCone(GLdouble size); void glutWireCone(GLdouble size);
- void glutSolidTorus(GLdouble size); void glutWireTorus(GLdouble size);
- void glutSolidDodecahedron(GLdouble size); void glutWireDodecahedron(GLdouble size);
- void glutSolidOctahedron(GLdouble size); void glutWireOctahedron(GLdouble size);
- void glutSolidTetrahedron(GLdouble size); void glutWireTetrahedron(GLdouble size);
- void glutSolidIcosahedron(GLdouble size); void glutWireIcosahedron(GLdouble size);
- void glutSolidTeapot(GLdouble size); void glutWireTeapot(GLdouble size);

Beginning Event Processing

- void glutMainLoop(void);
  - Enter the GLUT event processing loop
  - Once called, this routine will never return