

2D Demo Programs

All the 2D demo programs are listed below, with a description of the technical points illustrated in each program.

TransformOrder

This illustrates:

- creating the Direct3D interface,
- creating the Direct3D device,
- creating the Sprite interface,
- loading textures for sprites,
- displaying sprites with and without scaling, rotation and translation,
- the order in which scaling, rotation and translation are applied and
- the relationship between the centre of rotation and the scaled sprite.

RollingWheel

In addition, this illustrates:

- setting the transparent colour in a sprite texture,
- using the elapsed time to move a sprite across the screen at a speed that is independent of the speed of the PC on which the program is running.

Looper

In addition, this illustrates:

- using a texture to display more than one sprite,
- using two copies of a sprite to create a horizontally scrolling background,
- moving a sprite round a circle and synchronously rotating it,
- reducing the brightness of a sprite (and its size, to make it appear further away),
- creating a font and displaying text messages,
- calculating the frame rate

ScrollingLayers

In addition, this illustrates:

- scrolling layers, horizontally, at different rates to create an illusion of depth in a scene and
- using two copies of a set of three different sprites, in a horizontally scrolling background.

TiledBackground

In addition, this illustrates:

- scrolling a window, in both the vertical and horizontal directions, over a tiled rectangular area so that:
- an object moving over the tiled area is kept in view in the window and
- the window does not move off the tiled area.

Explosions

In addition, this illustrates:

- reading user input from the keyboard by polling the keyboard every frame, using the standard windows **GetAsyncKeyState** function,
- displaying a sprite for a fixed number of frames, in response to keyboard input,
- changing the scaling, rotation and translation of a sprite on each successive frame, to create the appearance of an expanding visual explosion, while using the same texture,
- changing the appearance of a sprite, by selecting a different section of a single texture, on each successive frame.
(Here this is used to create an explosion effect, but it can equally be used to create an animated sprite.)

SoundExplosions1

In addition, this illustrates:

- creating a DirectSound interface,
- creating a DirectSound device,
- finding the size of a (.wav) file,
- creating a DirectSound static buffer, large enough to hold a complete .wav file,
- locking the sound buffer, filling it with the sound data from the .wav file and unlocking the buffer,
- setting the frequency, volume and pan for the sound and
- playing the sound.

SoundExplosions2

In addition, this illustrates:

- creating the DirectSound interface and device using the **CSoundManager** class in the **dsutils** library package.

Collisions2D

In addition, this illustrates:

- a general purpose sprite class,
- multiple sprites sharing a single texture and
- detecting collisions between rectangular shaped sprites, allowing scaling, rotation and translation of both sprites.

DIKeyboard

In addition, this illustrates:

- using DirectInput to read the keyboard,
- a fun (but not very) application of collision detection,
- including deriving specialized classes for sprites with particular properties and/or behaviour and
- drawing lines as well as sprites.

DIMouse

In addition, this illustrates:

- using DirectInput to read the mouse position and button states and
- controlling the movement of a sprite with the mouse.

Transparency

In addition, this illustrates:

- how to make a sprite semi-transparent, so that the background partly shows through it.

This requires you to produce a .dds file, which has alpha values, as well as the normal rgb values, for each pixel in the image. You produce the .dds file using an application called DxDex. The inputs to DxDex are two bitmap images, one containing the rgb values and the other containing the alpha values