Lazy Foo' Productions

Atomic Operations

Last Updated 6/02/14

Semaphores operate at an operating system level. Atomic operations are a way to lock data at a efficient CPU level. Here we'll be locking a critical section using GPU spinlocks.

```
//Data access spin lock
SDL_SpinLock gDataLock = 0;

//The "data buffer"
int gData = -1;
```

Instead of a semaphore we'll be using a spinlock to protect our data buffer.

```
bool loadMedia()
{
   //Loading success flag
   bool success = true;

   //Load splash texture
   if( !gSplashTexture.loadFromFile( "48_atomic_operations/splash.png" ) )
```

```
    {
        printf( "Failed to load splash texture!\n" );
        success = false;
    }

    return success;
}

void close()
{
    //Free loaded images
    gSplashTexture.free();

    //Destroy window
    SDL_DestroyRenderer( gRenderer );
    SDL_DestroyWindow( gWindow );
    gWindow = NULL;
    gRenderer = NULL;

    //Quit SDL subsystems
    IMG_Quit();
    SDL_Quit();
}
```

Unlike semaphores, spin locks do not need to be allocated and deallocated.

```
int worker( void* data )
{
    printf( "%s starting...\n", data );

    //Pre thread random seeding
    srand( SDL_GetTicks() );

    //Work 5 times
    for( int i = 0; i < 5; ++i )
    {
        //Wait randomly
        SDL_Delay( 16 + rand() % 32 );

        //Lock
        SDL_AtomicLock( &gDataLock );

        //Print pre work data
        printf( "%s gets %d\n", data, gData );

        //"Work"
        gData = rand() % 256;

        //Print post work data
        printf( "%s sets %d\n\n", data, gData );

        //Unlock
        SDL_AtomicUnlock( &gDataLock );

        //Wait randomly
        SDL_Delay( 16 + rand() % 640 );
```

```
    }

    printf( "%s finished!\n\n", data );

    return 0;
}
```

Here our critical section is protected by SDL_AtomicLock and SDL_AtomicUnlock.

In this case it may seem like semaphores and atomic locks are the same, but remember that semaphores can allow access beyond a single thread. Atomic operations are for when you want a strict locked/unlocked state.

Download the media and source code for this tutorial here.

Back to SDL Tutorials

分享 14 Tweet

Download VPN for China
Unblock any Site. Try it Risk Free. 100% Secure. High Speed

Copyright Lazy Foo' Productions 2004-2015