SDL – Simple Directmedia Layer,

Audio und Video – Programmierung

Ideensammlung und Erfahrungsbericht

SDL – Simple Directmedia Layer

* Entwickelt von Sam Latinga (2001) - Loki Software

* Weiterentwicklung durch Communinity (2013 Version 2.0)

* Plattformunabhängig

* Audio / Video

* Ereignisbehandlung, Tastatur, Maus

* Threads

* Zeitgeber (periodisch, Wartezeit, abgelaufene Zeit abfragen...)

* sehr viele nützliche Quellen
  (zB: http://de.wikibooks.org/wiki/SDL)

SDL – Simple Directmedia Layer

Einfaches Beispiel (Auszug...) :

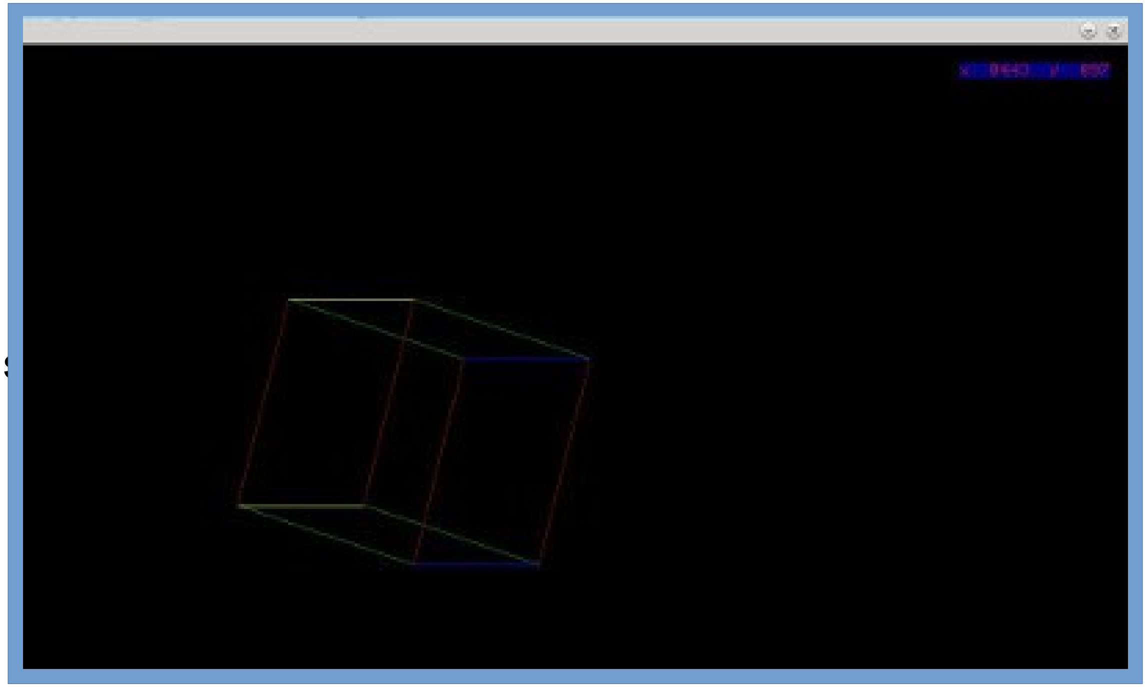
```
#include <SDL/SDL.h>
#include "sdl_interface.h"
...
int main ( int argc, char** argv )
{
    int  done = FALSE, key = 0, mouseX, mouseY, button;
    char text[TEXT_LENGTH];

    initSdl(WINDOW_SCREEN);
    while (!done)
    {
        if (checkEvent())
        {
            key = getKeyEvent();
            if (key == ESCAPE) done = TRUE;
            button = SDL_GetMouseState(&mouseX, &mouseY);
            If (button == MOUSE_BUTTON_LEFT) . . .

            sprintf(text,"x: %03d  y: %03d", mouseX, mouseY);
            printfSdl(text, WIDTH - 150, 30, LIGHTRED, BLUE);
            lineSdl(x1, y1, x2, y2, RED);
        }
        FlipSdl();
    }
```

SDL – Simple Directmedia Layer

Einfaches Beispiel (Auszug...) :



```
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    char text[TEXT_LENGTH];

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        }
        FlipSdl();
    }
```

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Ideen:

Erzeugeung eines Wave – Files:

zuerst: Header (Samplerate usw..) und Abtastwerte als Binär-File erzeugen

. . . fopen, fwrite usw. usw. - gute Wiederholung!!!

```
/* Init Audio Module:
 *                   + frequency (HZ)
 *                   |    + output sample format
 *                   |    |             + number of channels
 *                   |    |             |  + chunksize (bytes)
 *                   |    |             |  |
 *                   v    v             v  v                    */
    Mix_OpenAudio(44100, AUDIO_S16SYS, 1, 4096);


/** Load WAV-file */
sound = Mix_LoadWAV(fileName);


/** Play WAV-file */
channel = Mix_PlayChannel(-1, sound, 0);
```

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Ideen:

3D – Drahtmodell:

```
 float tensor[3][3] =
    {
        {1.,0.,0.},
        {0.,1.,0.},
        {0.,0.,1.}
    };
```

. . . .

x, y, z Koordinaten mit Drehtensor multiplizieren . . .

```
   (*X) = (int)(t[0][0] * x + t[0][1] * y + t[0][2] * z);
   (*Y) = (int)(t[1][0] * x + t[1][1] * y + t[1][2] * z);
   (*Z) = (int)(t[2][0] * x + t[2][1] * y + t[2][2] * z);
```

. . . .

```
   t[0][0] = cospsi;
   t[0][1] = sinpsi*sinphi;
   t[0][2] = sinpsi*cosphi;  usw.
```

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Ideen:

Threadprogrammierung – Quelle: https://wiki.libsdl.org/SDL_CreateThread:

```
#include "SDL_thread.h"
#include "SDL_timer.h"

static int TestThread(void *ptr);

int main(int argc, char *argv[])
{
    SDL_Thread *thread;
    int         threadReturnValue;

    thread = SDL_CreateThread(TestThread, "TestThread", (void *)NULL);
    . . .
    return 0;
}

// Very simple thread - counts 0 to 9 delaying 50ms between increments
static int TestThread(void *ptr)
{
    int cnt;
    for (cnt = 0; cnt < 10; ++cnt) {  printf("\n counter: %d", cnt);
        SDL_Delay(50);            }
    return cnt;
```

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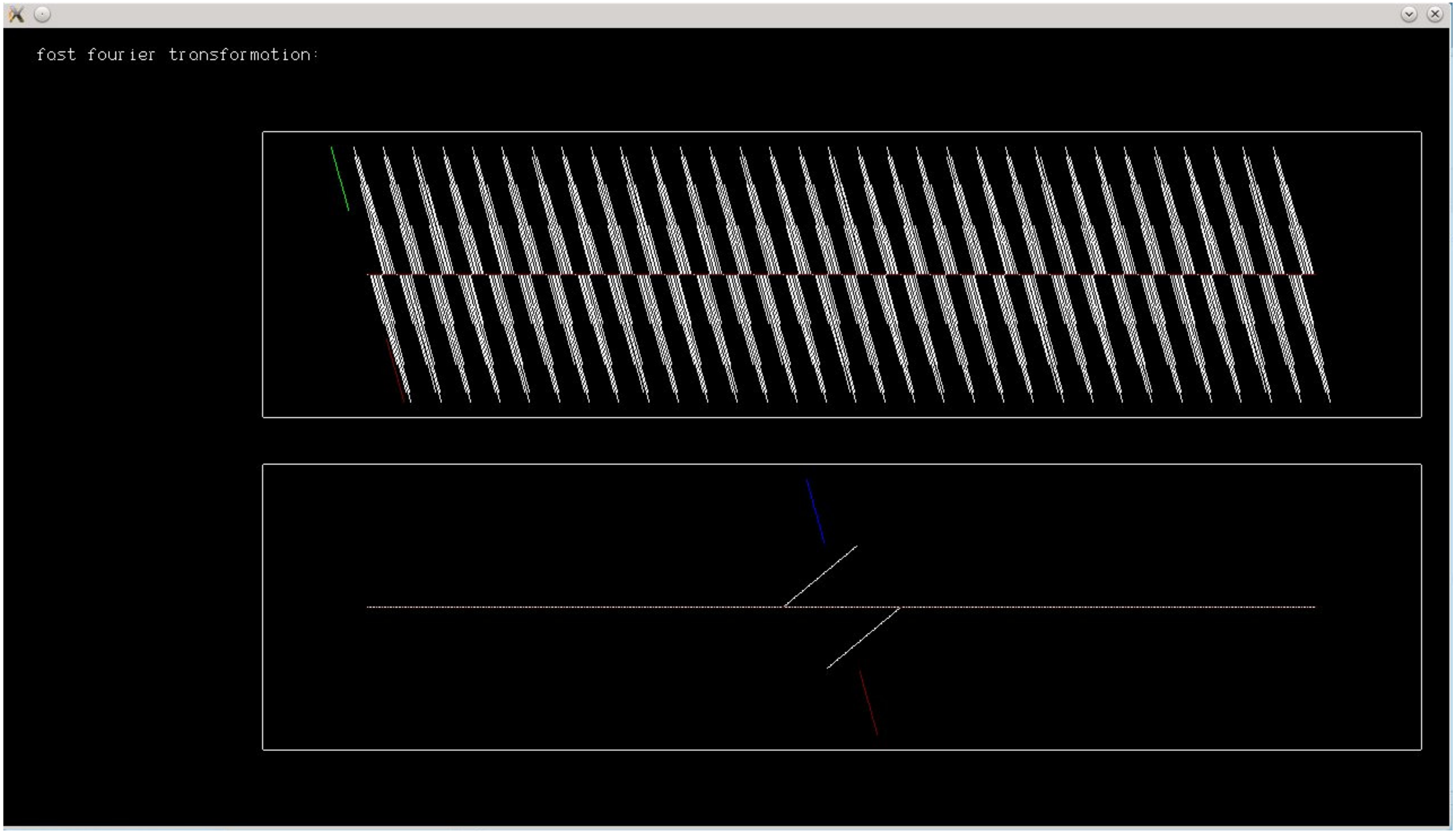
Ideen:

Butterfly-Algorithmus (FFT) - Ausgabe komplexer Signale in 3D



fast fourier transformation:

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VIEL Spaß!
Und gutes Gelingen!

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Kontonummer: 01010506789 :-)