Introduction

Graphics rendering is required in many embedded devices and applications such as graphical user interfaces (GUIs) but also in embedded systems without any display. An example for the latter case is HD-Matrix-LED light processing for automotive front- and rear-lights.

In many embedded systems, e.g. for system cost or legacy reasons, the graphics rendering job has to be done without a dedicated GPU (Graphics Processing Unit), i.e. it has to be done in software on a CPU while still significant rendering performance has to be achieved. At the same time many graphics applications, such as the examples mentioned above, only require 2D BLIT (Block Level Image Transfer) graphic operations.

The **egmlCoreLib** covers especially such cases by providing a comprehensive set of 2D BLIT routines, each of these highly optimized in performance by utilizing SIMD instructions, e.g. NEON, SSE and AVX.

The ANSI-C **egmlCoreLib** is designed to target entry class embedded processors with a simple RTOS or even on bare-metal (no OS) as it has no operation system dependencies and a tiny memory footprint. It is highly customizable so that it can easily be tuned for specific application requirements.

Features

Graphics rendering functionality

- Fill, blit, blitcolor, stretchblit, stretchblitcolor
- Clipping (blit / fill, stretchblit)
- Stretchblit: nearest neighbour + bilinear interpolation modes
- Porter Duff source over blending
- Per pixel and global alpha
- Alpha channel colorization

Image formats

- Alpha8, Luminance8, RGB565, ARGB32

Technology

- ANSI-C Library
- Utilizes SIMD instructions, e.g. NEON, SSE, AVX, ..
- Tiny memory footprint
- No OS dependencies and no dynamic memory allocations
    - suitable for RTOS or bare-metal (on OS) systems
    - easily portable
- Easily customizable and extendable with special purpose functions e.g. lighten / darken and additional color formats

Demo Kit

TES offers a free of charge Demo Kit allowing to quickly assess the capabilities of the egmlCoreLib. Please contact us at graphics@tes-dst.com!

Demo Application
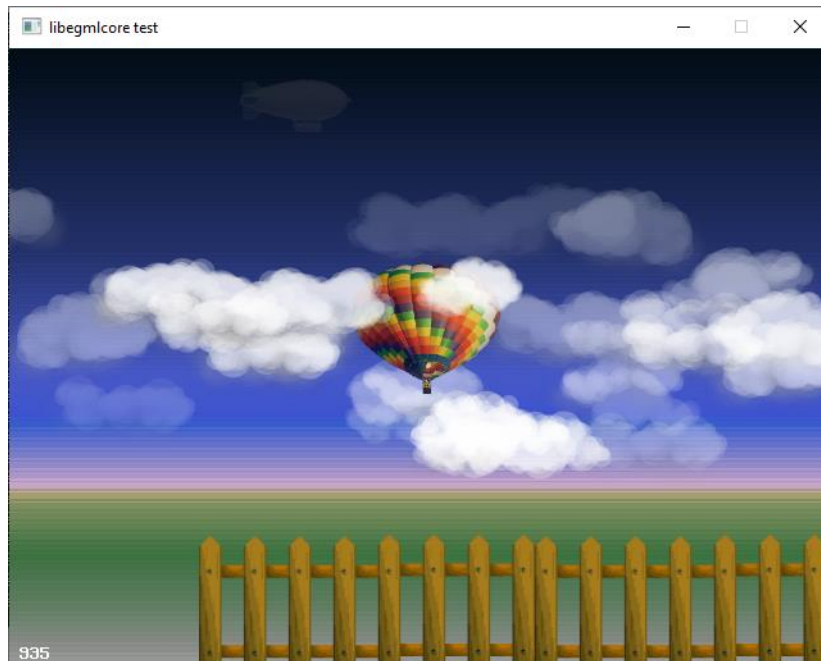
The demo application (640x480x32bit) showcases the following features:

- Alpha8 ⇒ ARGB32 clipped, colorized and alpha blended blits (per-pixel + global alpha) (Zeppelin)
- ARGB32 ⇒ ARGB32 clipped and alpha blended blits (Garden fence)
- ARGB32 ⇒ ARGB32 clipped and alpha blended stretched blit (Balloon)
- Alpha8 ⇒ ARGB32 clipped, colorized and alpha blended blits (per-pixel + global alpha) (Couds)
- Alpha8 ⇒ ARGB32 colorized blits (FPS display)

Performance

When the demo is quit by pressing the ESCAPE key, the minimum and maximum FPS are printed to the console (stdout), e.g.

- 2.6 GHz Intel i9 CPU (SSE2 build)
  - o   min FPS: 1073
  - o   max FPS: 1556
  - o   avg FPS: 1474.20
- 2.6 GHz Intel i9 CPU (AVX512 build)
  - o   min FPS: 1345
  - o   max FPS: 1874
  - o   avg FPS: 1874.16
- 800 MHz ARM Cortex A9 (NEON build)
  - o   min FPS: 100
  - o   max FPS: 116
  - o   avg FPS: 112.05

Demo/Eval Kit contents

- Precompiled demo application for
  - 32bit Windows 10
  - 64bit Windows 10
  - 32bit ARM Poky Linux
- Demo application source code (main.c)
- egmlCoreLib header file
- egmlCoreLib library (object code) for 32bit and 64bit Windows 10
- Demo Kit and egmlCoreLib API documentation

Business Model

egmlCoreLib Licenses

TES offers flexible license models:

- From evaluation license to production license
- From platform license with delivery as object code for a certain target processor and OS up to multi-platform license with source code delivery
- From single project/product to unlimited product

Services

Together with the egmlCoreLib we offer expert engineering services such as

- Porting to a new target platform (processor and OS)
- Graphics application development
- egmlCoreLib customizations
- Benchmarking and performance optimizations
- Support & Maintenance

Sales & Marketing Contact

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