

Project **Ne¹⁰**

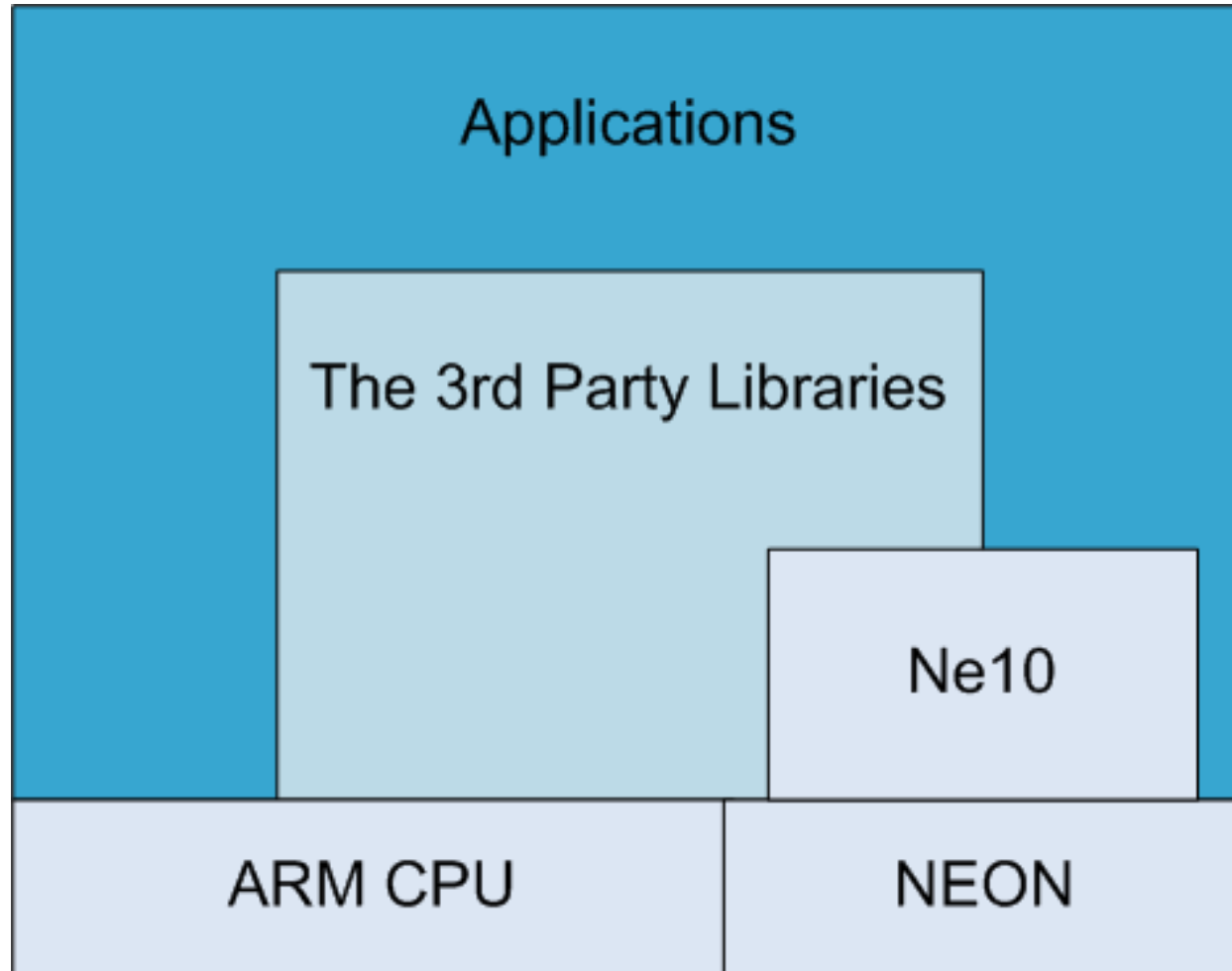
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Agenda

- What's Ne10?
- Why use Ne10?
- What's in Ne10 today
- How much faster?
- Getting Started with Ne10
- Summary
- Q&A

What is Ne10?



Why use Ne10?

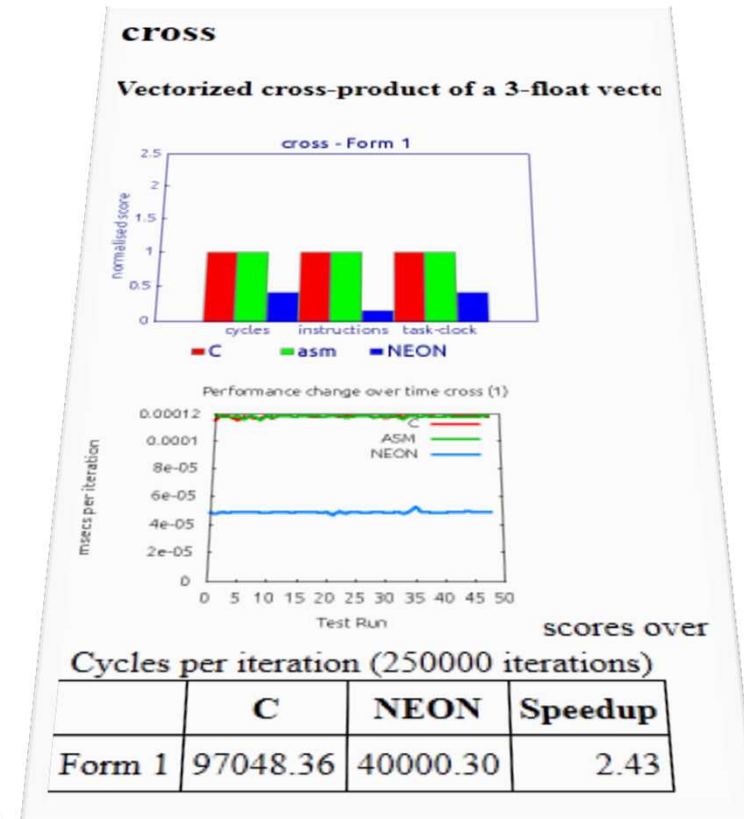
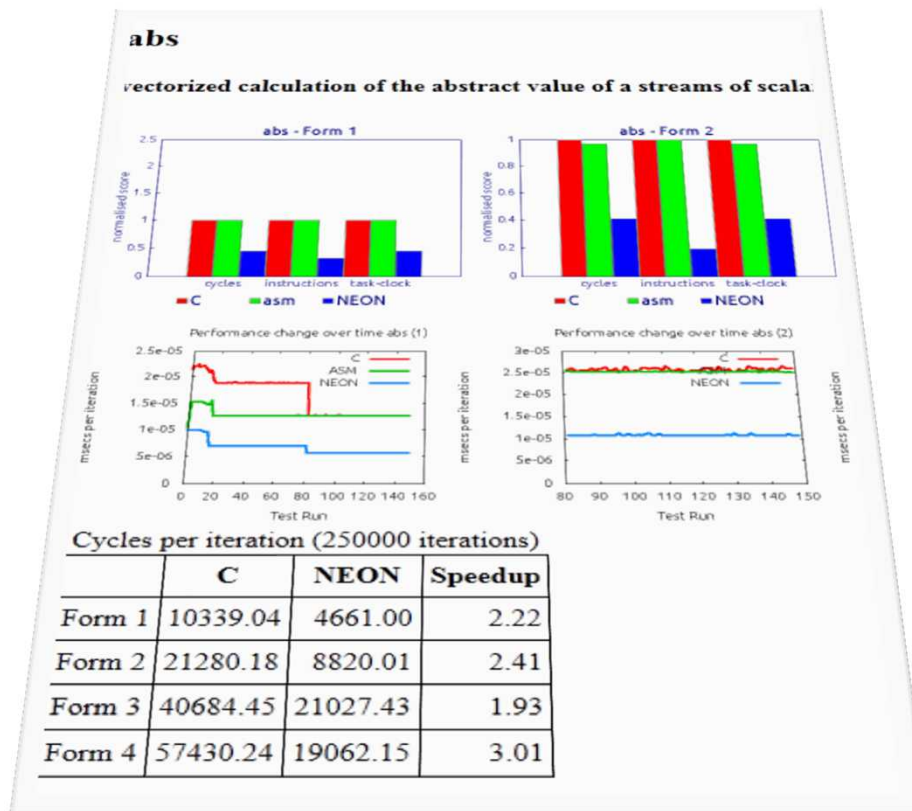
- Lets you get the most out of ARMv7/NEON without arduous assembly coding
- Free for non-commercial and commercial usage
- Easy to use out-of-box
- Apply well known algorithms optimized by NEON
- Enable developers to maximize app performance
- Available at <http://projectne10.org/>

What's in Ne10 today

- Vector Arithmetic
 - addc, subc, mulc, divc, mlac
 - add, sub, mul, div, mla
 - rsbc, setc, abs,
 - len, normalize
 - Dot, cross
- Matrix Arithmetic
 - Addmat, submat, mulmat, divmat, setmat
 - Detmat, Invmat, Transmat
 - Identitymat, Mulcmatvec
- FFT
 - Complex and real FFT/RFFT
- FIR/IIR
 - FIR, FIR Decimate, FIR Interpolate, FIR Lattice, FIR Sparse, IIR Lattice

How much faster?

- Snapshot from ARM Internal Test Farm for Cortex-A9



Getting Started with Ne10

The First Ne10 Program

- Call Ne10 directly

```
#include <stdio.h>
#include <stdlib.h>
#include "NE10.h"

main(void)
{
    int i;
    arm_float_t thesrc[5];
    arm_float_t thecst;
    arm_float_t thedst1[5];
    arm_float_t thedst2[5];
    for (i=0; i<5; i++)
    {
        thesrc[i] = (float) rand()/RAND_MAX*5.0f;
    }
    thecst = (float) rand()/RAND_MAX*5.0f;

    addc_float_c( thedst1 , thesrc, thecst, 5 );
    addc_float_neon( thedst2 , thesrc, thecst, 5 );
    printf("=====end=====\n");
}
```


The First Ne10 Program

- With auto NEON detection

```
#include <stdio.h>
#include <stdlib.h>
#include "NE10.h"

main(void)
{
    int i;
    arm_float_t thesrc[5];
    arm_float_t thecst;
    arm_float_t thedst[5];

    for (i=0; i<5; i++)
    {
        thesrc[i] = (float) rand()/RAND_MAX*5.0f;
    }
    thecst = (float) rand()/RAND_MAX*5.0f;

    NE10_init( );
    addc_float( thedst , thesrc, thecst, 5 );
    printf("====end====\n");
}
```

How to build and run the program?

- Obtain the latest version of Ne10:
 - Zip or Tar: <http://projectne10.github.com/Ne10/>
 - Git: `git clone git://github.com/projectNe10/Ne10`
- Compile it:
 - Native compiling
 - `mkdir build + cd build + cmake .. + make`
 - Cross compiling
 - Add cmake option: `-DCMAKE_TOOLCHAIN_FILE=../config.cmake`
- Build the sample:
 - `gcc -o sample sample.c -I$NE10_INC_PATH -I:$NE10_LIB_PATH/libNE10.a -lm`
- Run it:
 - `./sample`

Summary

- Ne10 is a long-term project.
- We need more feedback from developers about new Ne10 APIs.
- Every developers' suggestions/contributions are welcome.
- Ne10 will continue to evolve; the further grow will be application-driven:
 - SFFT
 - OpenCV
 - Other image processing functions
 - Support of OpenCL
 -

NEON

A neon sign spelling the word "NEON" in a light blue, sans-serif font. The sign is mounted on a dark, textured wall. The letters are made of glass tubes and are illuminated from within. Behind the letters, there are several screws and wires. A black cable is visible on the left side, and a white cable is visible on the right side. The overall lighting is dim, with the sign providing the primary light source.

Thank you