



Transitioning Computer Vision Algorithms from CPU to CPU/GPU

About Vricon

Vricon serves the global professional geospatial market with world-leading 3D geodata, 3D visualization solutions, and 3D image processing solutions. We're on a mission to build the Globe in 3D—a revolution in GEOINT tradecraft—that offers decision makers and analysts the entire world in highly accurate, immersive 3D. Vricon's customers are varied and come from the telecommunications, emergency response, defense, and intelligence communities.

We are searching for the best and brightest to join a culture that is open and flexible, inclusive and positive. We offer opportunities for growth and the ability to work with talented people who make a real difference for our clients. The majority of our research and development work is done in our Linköping office in Sweden, which employs about 40 engineers who work on cutting-edge technology to produce unparalleled, global, precise 3D geospatial data and software.

The Thesis

Our 3D maps are created with advanced 3D reconstruction algorithms. The code runs on multi-core CPUs using SIMD operations whenever possible, yielding great CPU performance. However, with the advent of GPUs for general-purpose computation we want to investigate how/if we can transition any parts of our reconstruction pipeline to harness the power of the GPU. The work will consist of roughly the following:

- Identify what parts of our computer vision chain are suitable for this transition
- Measure performance and compare code complexity between:
 - Hand-optimized CPU code
 - CPU/GPU-agnostic code running on CPU
 - CPU/GPU-agnostic code running on GPU

Qualifications

M.Sc. student with an interest in computer science and a passion for high-performance computing. You have some knowledge of parallel algorithms, and have some experience with multithreading/parallel frameworks such as OpenMP, Intel TBB, CUDA, OpenCL and/or SYCL.

Contact

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