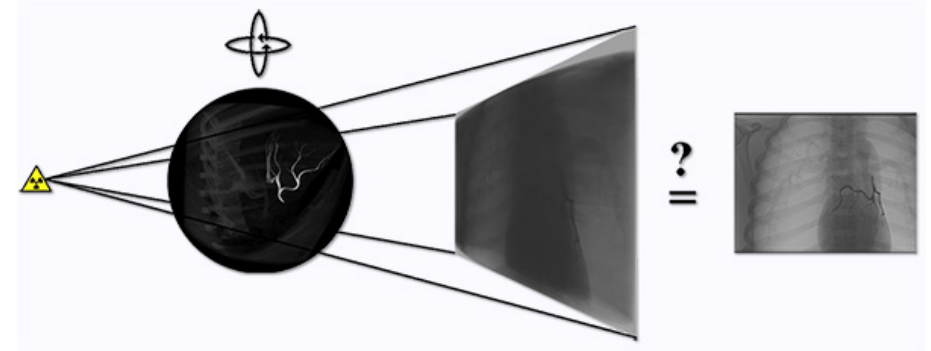


Evaluation of Intel Array Building Blocks

Today's desktop computers host processors with four or even more cores on a chip. While these processors provide huge raw processing power, it is hard for programmers to utilize them efficiently. Profound knowledge of the underlying hardware architecture as well as low-level languages (e. g., for vectorization) are required for good performance. To relieve the programmer



from such low-level details, high-level programming models emerged. Array Building Blocks is such a parallel programming model for standard multi-core and many-core processors like GPUs from Intel.

The aim of this thesis is to investigate the required changes and annotations to a sequential program using ArBB. Different parallelization approaches will be evaluated using the 2D/3D image registration as case study. In 2D/3D image registration, a preoperatively acquired volume is registered with an X-ray image. Therefore, a 2D projection from the volume is generated and is aligned with the X-ray image by means of translating and rotating the volume according to the three coordinate axes.

Prerequisites: Good C/C++ programming skills; Plus: Parallel programming experience

Nature of work: Theory (30%), Conception (20%), Implementation (50%)

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