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Evaluation of Hardware Accelerators for Lattice Boltzmann based Aneurysm Blood Flow Measurement

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Clipping is a potential treatment for ruptured/unruptured brain aneurysm patients. In order to determine the profitable treatment and also clip's location, surgeons need to have the measurements such as velocity and blood pressure in and around the aneurysm. Typically, simulating the blood fluid and finding the corresponding measurements require heavy computation resources. The Lattice Boltzmann (LB) method is the conventional way to simulate the fluid dynamics and HemeLB is an open-source computational suite for 3D fluid dynamics simulations of blood flow in the vasculature of the human body. In this work, we aim to evaluate the hardware acceleration of LB and HemeLB on reconfigurable system on chip (SoC) and high performance computing (HPC) machine using RAAD platform.

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