Research Project

Acceleration of non-rigid image registration with Tensor Cores

Jonathan LEVY

June 13, 2019

Outline

Cursus

About me

- Jonathan LEVY
- MSc student in Computer Science
- Wide background in Engineering

Cursus Summary

- *Classe Préparatoire PTSI/PT**
- Ecole Normale Supérieure de Rennes (BSc, Master in Teaching)
- *Agrégation* in Engineering, CS track
- MSc Embedded Systems, TU Delft

Current work

Since September 2019:
GASAL2 : GPU-accelerated library for DNA alignment

When	First as Extra Project, then MSc Thesis
Languages	C/C++ and CUDA
Algorithm	Smith-Waterman - optimal alignment for short pair

Goal: integrate in the *Burrough-Wheeler Aligner, "BWA"*

https://github.com/j-levy/GASAL2

https://github.com/j-levy/bwa-gasal2 ← private repository

Acceleration of non-rigid image registration with Tensor Cores

- Image registration: aligning a *floating* image with a *reference*.
- *Non-rigid*: various deformations allowed
- Use GPU for parallel calculation

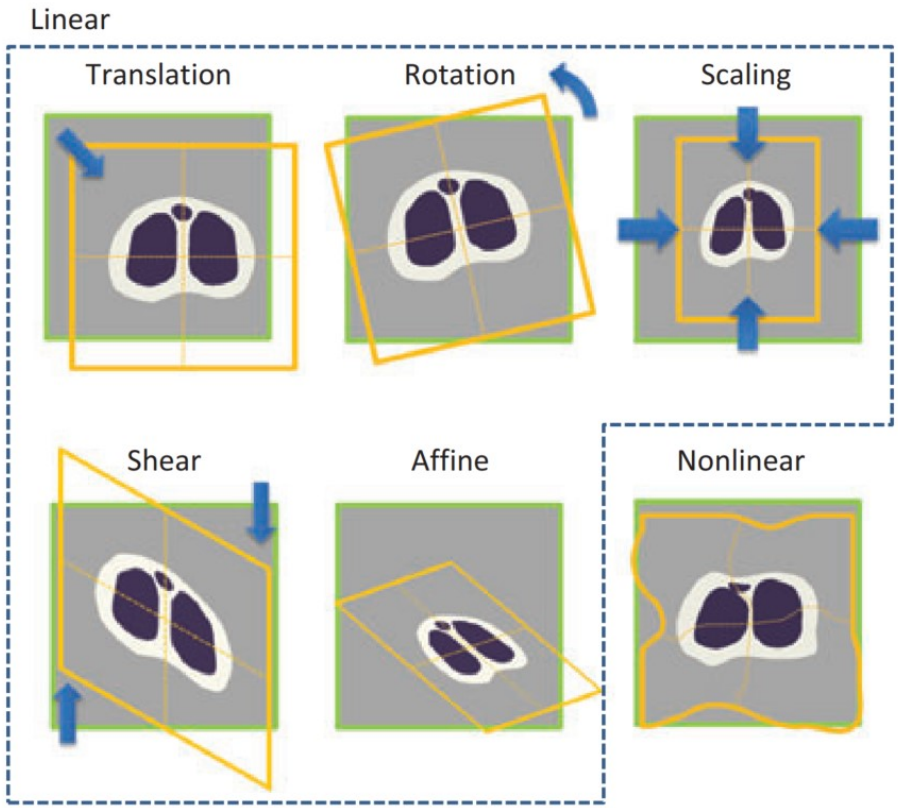

Figure: Different types of deformation.

The Volta Architecture

contenu...