

Master/ Bachelor Thesis

GPU computing for accelerating the Fisher Vector computation.

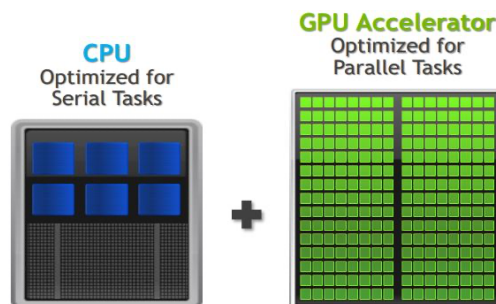
da/sec



da/sec is the biometrics and internet security research group and is affiliated with University of Applied Sciences Darmstadt and the National Research Center for Applied Cybersecurity (ATHENE). The group is led by Prof. Dr. Christoph Busch. The focus of the group is on highly innovative and applied IT security research in the special fields of biometrics, internet security, and digital forensics. Read more on <http://www.dasec.h-da.de/>.

Motivation & Goals

The large development experienced by GPU in the recent past has led to the speed up of several time-consuming techniques. Fisher Vector (FV) is an algorithm which derives a kernel from the parameters of a generative model (e.g., Gaussian Mixture Models (GMM)). This representation characterises how the distribution of a set of local features, extracted from unknown samples, differs from the distribution of known instances, which is previously learned by a generative model. Therefore, it involves several computational operations which could be successfully accelerated using GPU.



Tasks

- Analysis of several computational operations involved on the FV computation.
- Design and implementation of new strategies for parallelizing FV using GPU computing.
- Evaluation and benchmark of those parallel strategies mainly on Presentation Attack Detection.

Requirements

- High motivation.
- Interest in security technologies and biometrics.
- Strong interest in research.
- Programming skills on GPU computing is of advantages (e.g., CUDA C).

Start / Period

Immediately / by appointment

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