Title: Dataflow Simulator for Image Processing Graphs
Place: Imaging and Camera Technologies Group (ICG) in Eindhoven, the Netherlands
Duration: 6 months

Scope:
Intel Imaging and Camera technology Group (ICG) develops the Imaging Processing Units (IPU) that is integrated into various Intel SoCs. An IPU consists of multiple VLIW DSPs, fixed-function hardware accelerators, and control processors.

Description:
IPU architects need to perform high-level design space explorations at a granularity of mapping imaging graphs onto a set of resources. To do this efficiently, appropriate tools must be used to model the graphs and the system resources using the least amount of effort. Several proprietary tools exist to accomplish that, such as Synopsys Platform Architect. However, these tools enforce a vendor lock-in. Recently, IEEE released a new standard for SystemC extensions that defines two Models of Computation: (i) Timed Dataflow, which is based on the well-known Synchronous Dataflow, and (ii) Linear Signal Flow (LSF). According to the standard, “Timed Data Flow (TDF) [...] enables the modeling and efficient simulation of signal processing algorithms and communication systems at functional and architecture level”. Hence, the goal of this project is to build a tool (utilizing the new IEEE standard) that performs design-space exploration at an abstraction level of mapping TDF graphs onto a graph of heterogeneous resources. The intern will be working in close collaboration between the IPU modeling team and IPU architecture team.

Tentative Plan:
- Familiarization with the work environment and the task in hand (0.5 month)
- Understanding SystemC and TDF (1 month)
- Developing a tool to map an imaging pipe onto a set of resources using SystemC-AMS (3 months)
- Benchmarking and analysis (1 month)
- Writing of the thesis (0.5 month)

Requirements:
Candidates must satisfy the following requirements:
- M.Sc. student in one of the following fields: computer science, computer engineering, or electrical and electronics engineering
- Excellent programming skills

In addition, it is a plus if the candidate has the following skills:
- Good knowledge of C and C++
- Experience with parallel programming
- Experience with SystemC

How to apply:
Submit an online application through:
http://jobs.intel.com/ShowJob/Id/1026309/Media-Processing-Intern/