**Motivation**

Multi-Processor System-on-Chip (MPSoC) will play a central role in the vision system of next generation intelligent microscopes. This architecture provides a solution to the contrasting requirements of high computation power and versatile functionality on one hand, and stringent constraints of timing, power and space on the other hand.

**Task**

With a reconfigurable platform of Altera FPGA, this thesis aims to investigate the applicability and feasibility of MPSoC architecture for microscope-based automated screening applications:

- Functional requirement study of embedded processors for automated cell screening applications
- Mapping the proposed system architecture into Altera FPGA with NIOS II embedded soft-core processor
- Performance evaluation with representative cell detection and tracking algorithms