

## Announcement

24.02.2021

### MASTER THESIS:

# Hybrid Workflow Optimization for Crowdsourcing

#### DESCRIPTION

Human or machine, which one is more intelligent and powerful for performing computing and processing tasks? Over the years, researchers and scientists have spent significant amounts of money and effort to answer this question. Nonetheless, despite some outstanding achievements, replacing humans in complex tasks is not yet a reality. Instead, to compensate for the weakness of machines in some (mostly cognitive) tasks, the idea of putting humans in the loop, aka crowdsourcing, has been introduced and widely accepted. While crowdsourcing opens promising opportunities in supporting machine learning techniques, it also poses new challenges: 1) Noise is present in crowdsourcing data due to possible subjectivity, ambiguous task design, human error, and insufficient qualification worker skills, and 2) Crowdsourcing supervision and intervention can be costly and often not feasible. To solve this problem, you will model a given hybrid crowd-ai workflow with a modelling language such as UML or Petri-Nets. Further, you will use deterministic or probabilistic decision models to optimize the workflow's cost/quality efficiency on the example task of summarization.

The goal of the thesis is to model and optimize the given hybrid workflow for crowdsourcing. To realize this, the following steps are required:

- Literature analysis of current decision and optimization models and their application to crowdsourcing
- Theoretical and practical implementation of a selected optimization model for the given hybrid workflow
- Testing this model with a real crowdsourcing task.

*The thesis will be written in English.*

#### REQUIREMENTS

- Good statistical knowledge
- Fluent in one of the programming languages Python/Java
- Good knowledge of optimization and decision models (Operations Research)
- Course of study: computer science, computer engineering, industrial engineering, information systems management, media computer science

#### CONTACT

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