Master Thesis -
Data Analysis for Predicting CI Pipelines

Background
Continuous integration and continuous deployment (CI/CD) are common strategies in software development teams. The idea is to automate tasks related to integration and deployment of code changes, to increase quality and productivity. When a developer has made a code change, a series of automated tasks are executed. These tasks are known as a CI/CD pipeline, and usually include different stages such as building, testing, and merging of the code change.

Executing CI/CD pipelines can take a considerable amount of time and computational resources. These pipelines, while executing, generate a large amount of data. This data includes communication messages (events) among the different parts of the CI/CD system as well as status logs. There is a need to analyze this data and discover how can we use this for predicting pipeline behavior.

Thesis Description
We want to see whether we can model/predict CI pipeline behavior with the help of AI.

Some examples of CI pipelines predictions are:
• Will a certain step in the pipeline fail?
• How long will the pipeline take?
• How long will this step in the pipeline take?
• What test activities will be run for this source change, and how long before they finish?

The following steps are envisioned as part of the thesis work:
• Literature review available CI/CD (Continuous integration and continuous delivery) pipelines data analysis and predictions
• Collection and analysis of data
• Figure out what CI/CD pipeline behavior can be modeled with the existing data
• List questions that might be answered
• Modeling of data

Qualifications
This project aims at students in computer science or similar. Background in machine learning or data science is preferred.

Extent
1-2 students, 30hp each

Location
Ericsson AB Mjärdevi, Linköping

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Keywords
DevOps, MLOps, Continuous Integration and Deployment

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