MASTER THESIS – AI DEVELOPMENT FOR AUTOMATIC BUG ASSIGNMENT

Background
When a potential bug is found in the SW, the bug report describing the problem must be routed to the responsible organization. Today this is done manually and the purpose with this thesis work is to investigate the potential of automizing this routing by using an AI-algorithm.

A prototype AI-algorithm has been developed in Java to automatically handle this assignment. Currently the algorithm uses machine learning to train a classifier on historical bug reports. It is of interest to extend the system to include additional sources of information or techniques in order to train the system for further performance improvement. These could include artefacts such as test case verdicts, source code, product documentation, UML models or delivery information. New techniques could include Bayesian models, Topic Models, Deep Learning, Natural Language Processing or other new search techniques.

Thesis Description
The goal in this thesis is to analyze and improve the learning algorithm to make the Automatic Bug Assignment described in the background.

This thesis is divided into two parts. The first part is to analyze the algorithm and investigate potential improvements. The second part is to apply and study the findings from part one on the algorithm.

Goal statement
Develop and demo a working Java prototype of an extended Bug Assignment Tool based on our current prototype tool in Weka.

Sub goals
1) Read up on related works
   2) Implementation of extended Bug Assignment Tool
      a. Select suitable extension, possible alternatives:
         i. Include source code in training
         ii. Combine classification with information retrieval (IR) techniques
         iii. Include natural language parsing techniques for better feature extraction
         iv. Include delivery information in training
         v. Other ideas that the student may be familiar with or wish to explore
     b. Familiarize with current prototype implementation
     c. Implement additional techniques
     d. Compare new implementation with current prototype to evaluate improvements

Write report, demo prototype and present the results at an Ericsson seminar

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Qualifications
Previous experience in implementing machine learning, AI or statistical techniques and algorithms in Java. We expect you to have strong analytical skills, very good knowledge in probability theory, statistics and computer science and good programming skills. Performance evaluation and documentation skills are also required. We expect the master thesis report to be written in English.

The competence in the following areas are mandatory:
- Probability theory, statistics
- Programming skills in Java and preferably R interface
- Knowledge of Computer Science in general

We prefer candidates that have both Mathematics and Computer Science background.

Extent
1-2 students, 30hp

Location
Ericsson AB Mjärdevi, Linköping

Preferred Starting Date
Autumn 2016

Keywords
AI, Java, Machine Learning, Statistics, Probability

References

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