AutoML for TCP - Survey

[This document contains a transcription of the Google Form used to collect opinions of software engineers, software testers and expert researchers in software testing.]

This form contains a series of questions about the usefulness and difficulty of using machine learning techniques in the context of test case prioritization. Your responses will be treated anonymously, and only aggregated results will be published. The questionnaire contains 10 questions (estimated response time: 10 minutes). Thank you for your participation. If you have any questions, please contact the study authors.

Section 1 - Background and expertise

1. Please indicate your current job/position
    a. Software engineer/Project manager
    b. Software tester/QA team
    c. Management position (CTO, Tech lead, etc.)
    d. Academic position
    e. PhD/Master's student
    f. Other

2. Please indicate your level of theoretical knowledge in software testing
    a. Low, I have no specific training in software testing
    b. Medium, I have some basic knowledge of software testing
    c. High, I am an expert in software testing

3. Please indicate your level of practical expertise in software testing
    a. Low, I do not apply software testing techniques in my job
    b. Medium, I apply software testing techniques for some tasks in my job
    c. High, I regularly apply software testing techniques in my job

4. Please indicate your level of theoretical knowledge in machine learning
    a. Low, I have not taken any courses or obtained a degree in machine learning
    b. Medium, I have studied some machine learning topics independently
    c. High, I have taken specialized courses in machine learning

5. Please indicate your level of practical expertise in machine learning
    a. Low, I do not use machine learning techniques in my daily tasks
    b. Medium, I have applied some basic machine learning techniques in my daily tasks
    c. High, I regularly use machine learning tools or techniques in my daily tasks

Section 2 - Application of machine learning for test case prioritization

1. Test case prioritization involves ordering the test cases in a test suite. The goal is to detect the highest percentage of errors possible while consuming the least amount of time. What is your opinion on this testing activity?

a. I'm not familiar with it and have never used it before.
b. I've done it manually, although not systematically.
c. I find it necessary for the types of systems I work with, given that test suites are very expensive to run.
d. I often use it with the help of test automation tools.
e. Another opinion, please specify:

2. Machine learning can be applied to predict the failure probability of test cases and prioritize them accordingly. How would you rate the usefulness of this approach:

a. Low, the time required to execute my test suites is very low, so prioritization is not really necessary
b. Low, the time required to design and apply machine learning techniques would exceed the time required to manually prioritize the test suite
c. Medium, the use of machine learning to automatically determine which test cases are more relevant (i.e., have a higher failure probability) could be useful in certain situations
d. Medium, machine learning could complement manual selection or prioritization techniques
e. High, using machine learning would significantly reduce the time needed to prioritize test cases
f. High, using machine learning would increase the level of automation in my testing tasks
g. Other(s), please specify:

3. Please select one or more challenges you might face when using machine learning for test case prioritization:

a. Lack of knowledge about machine learning techniques
b. Effort required to design effective machine learning pipelines
c. Cost of data extraction and preprocessing
d. Cost of training process to address realistic problems
e. Difficulty integrating machine learning pipelines into testing tools
f. Other(s), please specify:

4. If a tool could automatically generate machine learning pipelines for test case prioritization, how would this affect your perception of the challenges you selected above?

a. None of the selected challenges would disappear

b. Some of the selected challenges might disappear, but the main barriers to using machine learning would remain
c. Most of the selected challenges would disappear, although new ones might also emerge
d. All the selected challenges would disappear
e. Other opinion, please specify:

5. Under what condition(s) would you consider adopting automatically generated machine learning pipelines for test case prioritization:

a. Demonstrated accuracy of the pipeline's predictions
b. Demonstrated reduction in the time required to decide which test cases to run
c. Good alignment with the specific needs of my software project
d. Easy integration with automated testing tools
e. Other(s), please specify:

Thank you for your time and responses.