Protocol

Framework for Summarization and Error Detection of In-Vehicle Network Traces

For the evaluation of the framework, we conducted a user study with experts, including semi-structured questionnaires. The experts are software engineers at BMW who do error diagnosis for defects with in-vehicle network traces. The participants are asked to do basic trace analysis tasks without and then with the support of the trace analysis framework. Questions (cf. questionnaire) are asked centering on the technology acceptance of the novel framework. Each interview will last a maximum of 60 minutes and will be divided into the following four phases:

Phase 1: Introduction

- Outline the purpose and the structure of the interview.
- Ask about the current role and background of the interviewee.
- Ask about the current state of practice (cf. questions 1, 2).

Phase 2: Trace Analysis Tasks without Framework Support

- Explain the two trace analysis tasks, to be solved by the interviewee.
- The interviewee can ask clarification questions.
- Ask the interviewee to solve error diagnosis tasks without the support of the framework (current state of practice).
- Task 1: Analyze trace data for a bug report indicating the following issue: "Central ECU is only activated after second button press on remote key."
- Task 2: Analyze trace data for a bug report indicating the following issue: “Car is not unlocked after remote key unlock press.”

Phase 3: Trace Analysis Tasks with Framework Support

- The basic concept of the framework is explained.
- The two trace analysis tasks, to be solved by the interviewee, are explained.
- The participants can ask clarification questions.
- Ask the interviewee to solve error diagnosis tasks with the support of the framework.
- Task 3: Analyze trace data for a bug report indicating the following issue: “Key search interrupted auto init sequence.”
- Task 4: Analyze trace data for a bug report indicating the following issue: “Central ECU sent wrong signal after reset.”

Phase 4: Feedback

- Ask questions based on Technology Acceptance Model (cf. questions 3-9).
- Ask about general feedback, overall impression, and suggestions (cf. questions 10, 11).