Reflective writing in the theory/practice transfer paper

Matriculation number: 8240

Accepted topic of the transfer paper: Effective video recording of browser based UI-Tests in software development

These questions are intended for reflection and support during the preparation of your transfer paper. We recommend you to ask yourself recurrently these questions before, during, and after the elaboration of the transfer paper in order to develop a scientifically founded paper. Please answer the questions with one or two sentences (enumerations are also possible) and do not forget to refer to the corresponding chapter in your transfer paper. In contrast to the transfer paper and to the assignment clarification, writing in the first person is desired within the framework of reflective writing. This form is an integral part of the assessment of the theory/practice transfer paper and therefore must be included for evaluation along with the paper itself.

You can use 2000 characters (without spaces) as a guideline for answering the questions.

Which are the central research questions of my topic?

The central research questions, derived from a requirement at PPI AG, center around screen recordings of automated user interface tests.

The first one covers the behavior of different video encodings regarding CPU usage and resulting bitrate to answer the question which codec is suited best for a restricted resource environment usually found in parallel UI testing.

The second question focuses on the delivery of previous recordings and asks which methods of delivery exist and what their benefits/drawbacks are.

Which objective do I want to achieve with the elaboration of the transfer paper and to what extent did I accomplish this at the end?

The transfer paper aims to answer the question which tools and codecs can be used to capture and deliver screen contents of automated UI tests in a headless environment.

Regarding codecs, a clear decision can be made based on the results as H.264 outperformed other codecs in CPU usage while still providing a reasonable bitrate. Even though this represents a trade-off, it is still a favorable choice in almost all environments due to the large gap in the CPU <—> bitrate ratio between H.264 and other codecs.
It is noteworthy though, that the results obtained can not be translated to every environment and depend on various factors. This may limit the direct applicability of the results — they can still be used as initial guidance for re-evaluation in different environments.

In terms of video delivery two very similar methods have been evaluated with no clear benefits for either. However, a common, abstract base format has been evaluated which reduces the implementation complexity for the specific delivery formats and thus makes a decision for one over the other almost obsolete.

How are my central questions/topics and the content that I have learnt during my academic studies connected?

The central questions tie in directly with the Software-quality module as they address a common issue that arises when scaling up UI focused testing. Since software testing and UI based testing made up a large portion of the lecture, the transfer paper made direct use of the content taught at the university.

What information have I drawn on for my work and why have I chosen this source?

Sources have been a major concern with this transfer paper. Video encoding and delivery is a topic in which large companies like Netflix and YouTube as well as other broadcasting/television companies have invested a large amount of money for research. Much of this research is either unavailable or if so only through technology blogs by said companies. For this reason it was necessary to rely on some sources like this. Additionally, statistics from these broadcasting companies have been cited, which are only available through their respective websites.

Individual research and independent evaluations, if available, have been incorporated where possible.

Another issue was that some sub-topics are too recent and thus no good scientific sources were available. For this reason a lot of technical specifications and similar sources have been used.

What is my approach to answering the research question?

Multiple methods have been employed. The first question was primarily answered through empirical analysis and statistics while the second one mostly relied on research and argumentation based on facts obtained from technical specifications.

Where do you see my personal contribution to answering the research question?

My personal contribution is largely based on the development of the empirical analysis methodology, implementation of the evaluation framework and the statistical evaluation of the results obtained through it.

Additionally, the evaluation of the technical specifications for protocols, codecs and formats can be seen as a contribution since much information is “hidden” within such specifications, not readily available to answer a research question.

What have I learnt from writing this transfer paper and what would I do differently next time? A reference to a chapter is optional in this case.

The primary lesson learned is that context matters. The environment in which the empirical study has been made directly influences and restricts the area in which the results are of use. In this case the absolute numbers are unusable and relative values have to be used. Even the relative numbers may change, depending on the environment. For this reason not all questions at PPI AG regarding the topic can be answered with the results obtained (namely storage use estimations). Next time extra care has to be taken to choose the correct environment to allow the broadest possible use.

Various small issues have been encountered in the methodology. For example, the encoding framework may influence the results since the codecs weren’t measured directly. Another example would be the browser itself — it has not been verified, that the screen contents are exactly equal and fluctuations due to web-page load times may have skewed the results slightly. Such small details have to be considered in later research papers.

Upload the completed reflective writing form (as a separate document) together with your transfer paper in the Campus Information System (CIS).