CS 5/7314: Software Testing and Quality Assurance

Sample Final Exam

Nov. 30 - Dec. 7, 2023

Student Name: _____

Exam grade: _____

General Instructions

- This is an open-book, take-home exam, totaling 50 points. But, you must complete your exam independently.

- Read exam questions/detailed instructions carefully before completing it.

- The exam will be posted/available on Canvas on Thursday, 11/30/2023 at 3pm.

- You must upload your completed exam to Canvas, ideally in a single file (multiple files are acceptable, although not preferable) by 6pm, Thursday 12/7/2023.

- **Good luck!**

Independent Study/Exploration Report/Essay .... *(50 points.)*

Your essay should cover some in-depth (published research in/by reputable journals/conferences/publishers) and up-to-date (must include research done in the last few years) studies of a chosen topic closely related to one of the chapters of our main textbook covered since Exam #2, or some of the topics briefly covered earlier but we didn't explore thoroughly, supported by at least two primary research papers, while satisfying the following specific requirements on the topic/paper/chapter selection:

- The topic must be selected from the following five topics corresponding to one of the chapters/sections of our main textbook:

    - C12a/Topic-1: Defect-based testing (Section 12.2, 4 references mentioned).
    - C12b/Topic-2: Web testing (instead of Section 12.4, use p2_b2WebTesting.pdf on Canvas/files as your base/anchor material).
    - C14/Topic-3: Software inspection.
    - C15/Topic-4: Formal verification.
    - C20/Topic-5: ODC (Section 20.2, or p3_j27webodc.pdf or p4_j31autoODC.pdf on Canvas/files)

- One research paper must be either

    - a) one of the papers (p2-p4) on Canvas/files mentioned above, or
    - b) from the list of referenced papers from the corresponding chapter/section of our main textbook, or
    - c) from the list of referenced papers from p2-p4.

- Another research paper must be outside the sources mentioned above and published within the last 10 years (2013 or after). I.e., you need to find other paper(s) on your own, published in a professional journal or conference proceedings, but not some web documents/"white papers"/internal reports/etc. Also, no survey papers here, please! As I mentioned in class, *online resources* from SMU Library is a good place to start.

- You are welcome to use more than two papers. But in that case, you must clearly identify your two primary sources satisfying the above requirements.

- Make sure you have access to the full papers, not just title/abstract/description/summary/etc. of the papers.

After you study the papers of your selected topic thoroughly, you need to write an essay (or an independent study/exploratory research report) to summarize what you learned and to express your own opinions, observations, and conclusions about the topic. Here are a few specifics about your essay:

- Your essay should be around 5 double-spaced pages in length, with a strict upper bound of 10 pages.

- Suggested outline/format of the essay:

    - a descriptive title (should be more specific/descriptive than the corresponding chapter/section title of our main textbook or the topic title above),
    - introduction,
    - problem-statement or topic description,
    - summary/results of your primary sources (your 2 selected papers),
    - discussions (the most important part! – see below),
    - conclusions,
    - references (list your two primary sources first, and then possibly other papers, if any).

- A summary of the chosen papers is only a part, but definitely not the whole, of your essay. It shouldn't exceed 1/2 of your essay/report in length,

- Relevance: In the early part of your essay, such as in the introduction/problem-statement section(s), you need to relate your selected topic and the primary source papers to the specific chapter (and section, if applicable) of our main textbook.

- After summarizing your primary source papers, a comprehensive discussion section should be included (if you choose, you may use multiple subsections, or even multiple sections), which should include:

  - an evaluation of the research and the results in the source papers, their strengths and weaknesses, what you'd have done differently,

  - an assessment of the importance of the research in the source papers and the overall impact on relevant testing/QA research and practice,

  - relevance of the topic selected and the research covered to your testing/QA-related work and/or to your course project.

  - possible future work along the same line and/or in related research areas, and a general outlook into the future about this research topic you selected,

  - any other discussions you deem relevant to the topic selected.

  Notice that these are your own opinions, not those already expressed in the source papers, based on your own knowledge/experience/reasoning/analysis/synthesis/etc. This is the most important (and original) part of your essay, making up about 1/3 to 1/2 of your essay/report in length, to demonstrate your understanding/mastery of the topic you selected.

- An overall conclusion should be included, to summarize the whole topic and your essay.