

Suggested Topics for Term Projects

This list is only a series of suggestions, in no particular order. Students will still need to identify specific research questions. Alternatively, students may choose a different project in the area of software process. All projects to be approved by the Instructor.

Projects to be undertaken in teams of 2.

1 Field Study

Conduct a study of software process at a organization that develops software. Options: document their software process, perform process improvement, build a historical database of metrics, an experience report on a successful or unsuccessful process improvement attempt. Some limited help is available in finding field sites; however, students will have less freedom in selecting a research question.

2 Controlled vs. Agile

Two teams complete the same software project independently, one using a highly controlled software process and the other using an agile process. Compare and contrast.

3 Hardware Development Process

The Waterfall model originated in computer hardware development. In the time since it was adapted to software, microprocessors have become significantly more complex. What process is currently used to develop hardware? Can recent innovations in software process be applied?

4 Software Process in Scientific and Engineering Domains

Find a scientific or engineering domain, such as physics, forestry, medical devices, etc. This can be a industrial field site or an academic research group. How do they develop software? What kinds of specialized tools and methods do they have? What do they need? Are current textbooks adequate? What might software engineering (or informatics) courses for those domains look like?

5 Over Time and Over Budget

How does a software project become late and over budget? How does this compare with projects in other domains, e.g. building construction (large and small), film production, authoring books, manufacturing, agriculture?

6 Evaluate a Software Process Tool or Notation

Use a software process tool or notation, to model or analyze a software process (or whatever is appropriate for the technology). Evaluate the effectiveness, usefulness, usability, etc. of the tool or notation. Evaluations can be conducted by comparing two different tools or notations, or by applying the tool or notation to different settings.

7 Study a Software Activity

Compare theory with practice with respect to a particular activity in the software lifecycle, e.g. requirements, design, refactoring. This project will involve a combination of literature review and empirical research. Choose a particular software activity and examine how the software engineering literature conceptualizes it. Compare this to how it actually occurs in practice.

8 Professional Texts vs. Research Literature

There is a large number of essays and books written by software engineers from industry trying to impart knowledge gained through experience. The most famous of these is “The Mythical Man-Month” by Brooks. Take a single work (book or chapter from a book) and find evidence to corroborate this folk wisdom. This evidence can be generated by this study, or it may be found the research literature, or other professional texts.

9 Personal Software Process

Complete all the exercises in the Personal Software Process, as described by Watts S. Humphrey in “A Discipline for Software Engineering”. This project is to be completed individually and is offered as an option for students who are unable to find a suitable research project.

10 Other

Inspections, metrics, COTS, legacy systems (replace or fix), new development vs. maintenance, small vs. large organizations, quality assurance, effort estimation, time studies