

## Seminar Configurable Systems

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Recursive Make

### Questions

Questions about *Recursive Make Considered Harmful* by Peter Miller. Pick four question for your group to answer, but not necessarily the first four questions.

1. Section 3.2 introduces the traditional way to invoke Make recursively. This fails to build the project reliably for the example, but does it have to fail for all kind of projects? Can you state conditions under which a recursive build does work as intended? In other words, what makes the example fail?
2. The paper contains claims without evidence; identify some that you find questionable and that you wish Miller had provided evidence for.
3. Section 5 lets automatically generated dependencies depend on source files. Does this guarantee that Make always knows the right dependencies?
4. Miller proposes to define Makefile fragments in sub directories which get included into a central Makefile. Can you see any problems with this approach besides the ones addressed in the paper?
5. Are variables from a Makefile visible in a recursively invoked Make? Compare variables in recursively invoked Makefiles and in a Makefile that gets included into a large Makefile.
6. Miller writes “it must be emphasized that this paper does not suggest that *make* itself is the problem.” Do you agree?
7. What concept do programming languages provide to support programming in the large? Make a list. Which ones does Make support?
8. If you had to specify the next-generation build tool for large systems, what concepts would you want, and why?

### Small-group work

As a reminder, here is our procedure to tackle questions during our meetings.

1. Divide into groups. We will try to form groups that are diverse, so that each group contains people with different degree of experience and research interests. Once the groups have been formed, introduce yourselves to each other.
2. Choose a recorder. Agree on one person to record the views expressed in your group, in particular

- decisions the group makes collaboratively,
  - significant dissent.
3. Discuss questions; use the black board, a laptop, or whatever you deem necessary to structure your answers.

### **The plenary session**

1. Recorders from individual groups will present their groups' conclusions.
2. Class discussion. We will discuss the answers together.