W12 Apr 01 (D3) Design space exploration

Jose Ferreira

All Sections

These questions are presented under the following assumptions:

- They may be selected to be part of the final exam
- Responses must be posted by the students (not me)
- I will call your attention to any mistakes or wrong content posted in response

N.B.: This question follows Jürgen Teich's "**Hardware/Software Codesign: The Past, the Present, and Predicting the Future** ", *Proceedings of the IEEE*, Vol. 100, May 13th, 2012.

Design space exploration may be defined as "the task to explore the set of feasible implementations 1) *efficiently* and 2) finding not only one of these, but 3) *many* and also 4) *optimal* ones". This may be considered as a threefold problem involving the main aspects indicated below. Briefly explain the scope of each one of them, and clarify if they relate solely to the hardware development tasks, to the software development tasks, or to both.

1. Exploration cost and exploration strategies (algorithms);
2. Multiobjective nature and evaluation of nonfunctional properties;
3. How to flexibly evaluate the quality of a design point?