UiO / IFI / PUT
Spring 2025
Questions on Context-Awareness

1. What is the definition of context? Provide an example that illustrates the relevance of the information.

2. What is a context-aware system?

3. There are three main features that context-aware systems may provide. Which are these?

4. Regarding the categorization of the architectural options available to the application developer of distributed context systems, there are four layers: capture, infer, distribute, and consume. For layers **capture** and **infer**, provide a short description of each layer's functionality; also present a figure that illustrates how the four layers are layered.

5. In context-aware systems, the word **sensor** not only refers to sensing hardware but also to every data source which may provide usable context information thus leading to physical and virtual sensors. Do you agree (answer "yes" or "no")? Provide: i) the definition of each sensor type (physical and virtual), and ii) an example for a physical sensor and another for a virtual sensor.

6. Consider the following sentence: "*For proactivity to be effective, it is crucial that a pervasive computing system tracks user intent*." Do you agree with this sentence? Is the user intent the only relevant information for a system to be proactive? Justify your answer.

7. Consider the need of a mobile/ubiquitous system to adapt automatically to the context. Present an example in which the high speed at which a system is capable to adapt is good and another example in which such high speed is not good.

8. In addition to the huge number of users and messages exchanged, **context propagation** creates unique challenges in the realm of distributed systems. What **challenges** are these? Provide **examples** that illustrate each challenge.

9. Where can the context-inference layer runs? The location is intimately related to several properties of a context-aware system; which ones are these?

10. Regarding reusability, how does it evolve depending on the location of the inference layer?

11. Regarding personalization, how does it evolve depending on the location of the inference layer?

12. Context has to be distributed among the system components (sensors, middleware, application). Which approaches can be used? What are the main distinctive aspects for each one?

13. Regarding the consume layer, what are the several options and how they work?