Predictability is always subject to the underlying assumptions being made. For real-time systems, the time response of processes in relation to the strictness of deadlines is of particular importance. With an additional focus on embedded systems, space and energy requirements become relevant as well and need to be considered in combination. As far as software is concerned, structure and organization of the programs to be executed determines whether or not predictable processes will take place in a given computing system. Design for predictability is an overarching aspect that crosscuts the whole computing system and particularly addresses operating systems.

This talk is about structuring principles of non-sequential programs - in the shape of but not limited to operating systems - to abet predetermination of quality attributes of non-sequential (real-time) processes, it is not about analytical methods to effectively predetermine these attributes. Issues in operating systems as to space, timing, and energy requirement are touched. Emphasis thereby is on the coordination of cooperation and competition between processes, namely synchronization. It is shown how measures of process synchronization against the background of many-core processors cater to these issues.

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