

Cyberpatterns: Towards a Pattern Oriented Study of Cyberspace

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Abstract. Cyberpatterns are patterns in cyberspace. A pattern represents a discernible regularity in the natural world or in manmade systems. From a prescriptive point of view, a pattern is a template from which instances can be created; while from a descriptive point of view, a pattern shows how phenomena repeat in a predictable manner that can be observed and recognised. Similar to theories in sciences, patterns explain and predict regularities in a subject domain. In a complicated subject domain like cyberspace, there are a large number of patterns that each describes and predicts a subset of recurring phenomena, yet these patterns can interact with each other and be interrelated and composed with each other. The pattern-oriented research method studies a subject domain by identifying the patterns, classifying and categorising them, organising them into pattern languages, investigating the interactions between them, devising mechanisms and operations for detecting and predicting their occurrences, and facilitating their instantiations. This talk illustrates this research methodology through a review of the research on software design patterns as an example of successful application of the methodology. It then proposes a general theory of patterns, including an algebra of pattern operations, and semantics of pattern instantiation and composition. Finally, the possible applications to cyberpatterns are discussed. It defines the scope of research, reviews the current state of art and identifies the key research questions on cyberpatterns.