

# Aspect-oriented Programming Using Composition-Filters

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Software engineers may experience problems in modeling certain aspects while applying object-oriented techniques [4, 10, 11]. Composition-Filters are capable of expressing various different kinds of aspects in a uniform manner. These aspects are, for example, inheritance and delegation [1] and atomic delegation [2], multiple views, dynamic inheritance and queries on objects [3], coordinated behavior and inter-object constraints [5], real-time [6] and composing real-time and synchronization together [9], synchronization [8] and distributed synchronization [7], and client-server architectures [10]. Each filter provides extensibility within its aspect domain, such as reusable synchronization specification [8]. In addition, each aspect expressed by a filter can be composed easily with other aspects [9]. Since filters are declarative aspect specifications, the aspect composition process can be realized both at run-time and compile-time. In case of compile-time composition, the time performance is better. In run-time composition, however, aspect specifications are preserved and therefore new aspects can be introduced dynamically. The aspect composition process is simple and generally does not require aspect specific generators.

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