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Asynchronous Programming in the Abstract Behavioural Specification Language

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Chip manufacturers are rapidly moving towards so-called manycore chips with thousands of independent processors on the same silicon real estate. Current programming languages can only leverage the potential power by inserting code with low level concurrency constructs, sacrificing clarity. Alternatively, a programming language can integrate a thread of execution with a stable notion of identity, e.g., in active objects. **Abstract Behavioural Specification (ABS)** is a language for designing executable models of parallel and distributed object-oriented systems based on active objects, and is defined in terms of a formal operational semantics which enables a variety of static and dynamic analysis techniques for the ABS models. The overall goal of this thesis is to extend the asynchronous programming model and the corresponding analysis techniques in ABS.

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