A central aim of computer science is to put the development of hardware and software systems on a mathematical basis which is both firm and practical. Such a scientific foundation is needed especially in the construction of reactive programs. Examples of such programs are communication protocols, control systems.

They are characterized by a perpetual interaction with their environment as well as a non-terminating behaviour. Correctness is very important and very difficult to ensure.

The theory of automata on infinite objects, in particular omega-automata, constitutes a powerful and elegant theoretical basis for the construction and analysis of reactive programs. This talk will survey a number of key issues in the theory of automata on infinite objects.