A Type-theoretic Description of Action Calculi

Philippa Gardner

Abstract

Action calculi, introduced by Milner, provide a framework for investigating models of interaction. This talk will focus on the connection between action calculi and known concepts arising from type theory. The aim of this work is to isolate what is distinctive about action calculi, and to investigate the potential of action calculi as an underlying framework for many kinds of computational behaviour.

The first part of the talk will introduce action calculi. In the second part, I'll give a type-theoretic account of action calculi, using the general binding operators of Aczel. I will discuss two extensions: higher-order action calculi which correspond to Moggi's commutative computational lambda-calculus, and linear action calculi which correspond to the linear type theories of Barber and Benton.

This talk is based on joint work with Andrew Barber, Masahito Hasegawa and Gordon Plotkin. If time, I will also describe current work arising from the connections described above.