

Title: Directed Identity

Abstract:

Identity, i.e., « being the same as itself » is a key logical concept that has been a subject of hot philosophical debates during many centuries. Today this continuing philosophical discussion usually relies on the formal representation of the identity concept by standard means of symbolic logic where identity is construed as an equivalence relation (that is, a binary relation which is reflexive, symmetric and transitive) which satisfy the Indiscernibility of Identicals principle according to which identical things have the same (i.e. identical) properties.

This large formal framework admits many competing philosophical views on identity. Using this framework as a common ground logicians and philosophers discuss whether or not the converse principle of Identity of Indiscernibles also holds, how to explain away the intuitively plausible preservation of identity through time and change (which at the surface contradicts InId since it allows the same thing to have different properties at different times), how to resolve classical paradoxes of identity such as the Ship of Theseus, and many other akin issues.

In my talk I shall explore some alternative formal approaches to representing identity that use Category theory and a modern version of Type theory called Homotopy Type theory (or HoTT for short) because of its intended interpretation in a branch of modern Algebraic Topology called Homotopy theory. As we shall see, in this alternative formal framework the identity concept is construed very differently, which sheds a new light on some long-lasting logical and philosophical puzzles. I shall make a special focus on a version of HoTT known as Directed Type theory (DTT for short) where identity comes in a directed non-symmetric form. This identity concept allows one to formalise the claim that today I am still the same person as I was 50 years ago when I was a boy without assuming that today that boy is the same person as myself.

Attending and understanding the talk does not require any previous knowledge of mathematical logic, of Type theory and Homotopy theory: all needed logical and mathematical concepts will be informally introduced and explained during the talk.