Speaker: Tarmo Uustalu

Title: Proof Transformation for Program Optimizations

I advocate a general technology of achieving mechanical transformation of program proofs corresponding to program optimizations. This is based on presenting program optimizations declaratively as type systems with a program transformation component whereby types are employed to record the program analysis information licensing the optimization. I show this method in action on a variety of optimizations, including some most basic standard ones, but covering also subtle optimizations based on bidirectional analyses and edge-splitting program optimizations. I argue that proof transformability is essentially a logical version of optimization soundness; each entails the other. (Joint work with Ando Saabas.)