

# Hands-On Introduction to Nominal Isabelle

## One-Day Tutorial at POPL



**Date: 23rd January 2011**

**Overview:** Dealing with binders, renaming of bound variables, capture-avoiding substitution, etc., is very often a major problem in formal proofs about the lambda-calculus and programming language theory. Nominal Isabelle provides an infrastructure for reasoning conveniently about bound variables and alpha-equivalence classes in the proof assistant Isabelle. The aim of the tutorial is to give participants a reading knowledge of nominal techniques and allow them to start using Nominal Isabelle in their own work. The tutorial will be hands-on and therefore participants are encouraged to bring their own laptop.

### **Programme:**

- Session I: basics, alpha-equivalence, substitution lemma, Isar proof-language
- Session II: strong induction principles, contexts with holes, beta-reduction
- Session III: variable convention, evaluation relations, CK-machines
- Session IV: functions, type-preservation, progress lemma

**Target audience:** Researchers and doctoral students who want to use Nominal Isabelle to formalise proofs from the lambda-calculus, from programming language theory or from proof theory, such as type soundness, Church Rosser, strong normalisation and so on. The tutorial is designed for people who have not necessarily used Isabelle before, nor have used any other proof assistant.

**More Information:** See <http://isabelle.in.tum.de/nominal/>



