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**"Formal Proof of SCHUR Conjugate Function"**  
(joint work with Franck Butelle, Florent Hivert  
and Frédéric Toumazet)

**Abstract:**

The main goal of this work is to formally prove the correctness of the key commands of the SCHUR software, an interactive program for calculating with characters of Lie groups and symmetric functions. The core of the computations relies on enumeration and manipulation of combinatorial structures. As a first "proof of concept", we present a formal proof of the conjugate function, written in C. This function computes the conjugate of an integer partition. To formally prove this program, we use the Frama-C software. It allows us to annotate C functions and to generate proof obligations, which are proved using several automated theorem provers. We also draw on methodology, discussing on how to formally prove this kind of program.