

US-FRANCE/GERMANY COOPERATIVE ACTIVITY:  
CIRCUIT AND SYSTEM VERIFICATION USING WORD-LEVEL INFORMATION

**PROJECT SUMMARY**

The purpose of this project is to add the International Cooperation Dimension to the newly awarded NSF award, CCR-0204146, titled: "Taylor Expansion Diagrams: a Compact Canonical Representation for RTL Verification", award period: Oct. 2002 - Sept. 2005.

The PI would like to establish a formal international cooperation with the following research groups in France and Germany:

- Prof. Bruno Rouzeyre, LIRMM, University of Montpellier II, France;
- Prof. Emmanuel Boutillon, LESTER, University of Bretagne Sud, France;
- Prof. Rolf Drechsler, Dept. of Computer Science, University of Bremen, Germany.

These researchers are internationally recognized experts in architectural and high level synthesis, test, and binary/word-level decision diagrams. The initial collaboration has been established during the PI's sabbatical in France during the academic year 2000/2001, where the idea of Taylor Expansion Diagrams as an experimental data structure for RTL verification has been conceived.

The objective of this collaboration is to jointly develop and exchange fundamental techniques in design verification and architectural synthesis based on modern data structures, such as decision diagrams. With these representations the designs can be represented on higher level of abstraction, by exploring the word-level information inherent in HDL design specifications. In particular, we will explore the application of Taylor Expansion Diagrams (TED), to the verification designs specified at the behavioral and register transfer levels (RTL). We shall also investigate the application of TEDs to architectural synthesis from algorithmic descriptions.

The requested NSF support will fund travel for the PI and/or one graduate research assistant to France and Germany to work with Professors Rouzeyre, Boutillon, and Drechsler. The foreign partners are independently seeking funds from their respective agencies (DADD in Germany, and CNRS in France) to support their travel to the United States in order to conduct this cooperative research. Additional cooperation will be achieved at a no-cost basis, with research results exchanged regularly via electronic mail and conference meetings.