Richard Sommer* (sommer@epgy.stanford.edu), EPGY, Ventura Hall, Stanford University, Stanford, CA 94305-4115. *A logical framework for computer-verified proofs in undergraduate mathematics.*

In this talk we describe the logical framework implemented in a system for constructing proofs in university-level mathematics courses. Students in the Education Program for Gifted Youth (EPGY) at Stanford University are currently using this system in courses in geometry, linear algebra, and multivariable calculus. The EPGY Theorem-Proving Environment allows users to easily input mathematical expressions, apply proof strategies, verify logical inference, and apply mathematical rules. One of the goals of this project is to match, as close as possible, the style and techniques of proofs that are found in ordinary textbooks. Among the greatest challenges in creating a system that imitates standard mathematical practice, but allows for computer-verified proofs, is dealing with potentially undefined terms that result from the use of partial functions. Additionally, the system needs to deal with multiple sorts, higher order objects, implicitly defined functions, and overloaded function and relation symbols. Here we describe the main features of our formal system. The description will focus mainly on how undefined terms are handled by using a strong interpretation of relations. (Received January 11, 2002)