UNIVERSITY OF SOUTH FLORIDA

Defense of a Master's Thesis

A Flexible, Natural Deduction, Automated Reasoner for Quick Deployment of Non-Classical Logic

by

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For the MSCP degree in Computer Science & Engineering

Automated Theorem Provers (ATP) are software programs which carry out inferences over logico-mathema often with the goal of finding proofs to some given theorem. ATP systems are enormously powerful programs, capable of solving immensely difficult problems. Currently, many automated theorem provers exist lik SPASS, ACL2, Coq etc. However, all the available theorem provers have some common problems: (1) Current A tend not to try to find proofs entirely on their own. They need help from human experts to supply lemmas, proof, etc. (2) There is not a single proof system available which provides fully automated platforms for both Logic (FOL) and other Higher Order Logic (HOL). (3) Finally, current proof systems do not have an easy quickly deploy and reason over new logical systems which a logic researcher may want to test. In respons problems, I introduce the MATR framework. MATR is a platform-independent, codelet-based (indepe operating processes) proof system with an easy-to-use Graphical User Interface (GUI), where multiple cod selected based on the formal system desired. MATR provides a platform for different proof strategies like and backward reasoning, along with different formal systems such as nonclassical logics. It enables users t own proof system by selecting from the list of codelets without needing to write an ATP from scratch.

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