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Position Paper

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My current work in automated reasoning is on two fronts, the second of which is collaborative and, alas, not yet ready for public presentation.

The first concerns a general method for developing and proving completeness of terminating sequent calculi for intermediate (i.e. super-intuitionistic) propositional logics, generalising the techniques for bounding depth of proof search by a linear function (with small coefficient, e.g. three) of the size (in some sense) of the end-sequent. These techniques can be found in work of Vorob'ev [1950], Hudelmaier [1988, 1991, 1992], Lincoln et al [1991], Fiorino [2001] and myself [1991]. For such logics, e.g. (of course) intuitionistic logic, Gödel-Dummett logic and (I anticipate) Jankov logic, the techniques can be justified by means of the notion of a *pure proof* and an argument that every proof can be *purified* by application of appropriate permutations. Variations arise with the possibility of using both single-succedent and multi-succedent calculi. More refined calculi for such logics can then be developed as optimised versions of these terminating calculi, as in work by Weich [2001] and Larchey-Wendling [2003].