

Stone Duality for First-order Logic: A Nominal Approach to Logic and Topology

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We give a finite and purely equational axiomatisation of first-order classical logic in nominal algebra, and using an accompanying semantics in nominal sets we prove a duality theorem for a suitable generalisation of Stone spaces. The technical details are non-trivial and include new ideas including sigma- and amgis-algebras. There is also the motivation that it is possible at all, and in a relatively straightforward manner, to use nominal logics and semantics to extend duality to logic and topology in the presence of terms, variables, and bindings. This has never been done before in quite this way, and I even hope it will exemplify a new family of duality proofs.