

Stone duality in the theory of formal languages

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Stone duality is a categorical duality between Boolean algebras (or distributive lattices) and compact zero dimensional spaces (or spectral spaces). Mathematically, it shows that in this core setting, corresponding to propositional logic, algebraic and geometric reasoning are equivalent. This duality is at the core of many completeness results both in mathematical, philosophical, and computer science logic, but it is also key to combinatorial characterisations of logics, e.g. in stability theory and, more recently, in the area of complexity theory known as formal language theory. In this talk we will introduce the duality and show how it is applied in the theory of formal languages with special attention on regular languages and circuit complexity classes. This talk concerns joint work with Grigorieff and Pin and with Krebs and Pin.