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Nominal Topology for Data Languages

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Fabian Birkmann, Stefan Milius, and Henning Urbat

Abstract: We propose a novel topological perspective on data languages recognizable by orbit-finite nominal monoids. For this purpose we introduce pro-orbit-finite nominal topological spaces, which for bounded support size coincide with nominal Stone spaces and are shown to be dually equivalent to a subcategory of nominal boolean algebras. Recognizable data languages are characterized as topologically clopen sets of pro-orbit-finite words. In addition, we explore the expressive power of pro-orbit-finite equations by establishing a nominal version of Reiterman's pseudovariety theorem.

Presenters: BIRKMANN, Fabian; URBAT, Henning

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