TOPOSES OF MONOID ACTIONS

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In our thesis, which is based on [1], [2], [3] and [4], we studied toposes of actions of monoids on sets. We began with ordinary actions, producing a class of presheaf toposes which we characterized. As groundwork for considering topological monoids, we branched out into a study of supercompactly generated toposes (a class strictly larger than presheaf toposes). This enabled us to efficiently study and characterize toposes of continuous actions of topological monoids on sets, where the latter were viewed as discrete spaces. Finally, we refined this characterization into necessary and sufficient conditions for a supercompactly generated topos to be equivalent to such a topos of actions of a topological monoid.

In our talk we will explain the notion of topos and how we obtain special cases of toposes from monoid actions, before giving an overview of the strategy and main results of the thesis, including.

We will also present some of the ways that this work is being extended beyond actions on sets and some potential applications.

Several parts come from joint work with Jens Hemelaer.

References

[1] , ROGERS, M., *Toposes of Discrete Monoid Actions*, preprint, 2019

[2] HEMELAER, J. AND ROGERS, M., *Monoid Properties as Invariants of Toposes of Monoid Actions*, Applied Categorical Structures, 2021

[3] ROGERS, M., *On Supercompactly and Compactly Generated Toposes*, Theory and Applications of Categories, 2021

[4] ROGERS, M., *Toposes of Topological Monoid Actions*, Compositionality (submitted), 2021

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