

Algebras with representable representations

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The representations of a Lie algebra L on a vector space M are measured by Lie homomorphisms from L to $\mathfrak{gl}(M)$. The existence of such a special object as $\mathfrak{gl}(-)$ seemed somehow a very unique property, since it is not easy to find further non-trivial examples apart from groups or Lie algebras.

We proved that, in fact, its existence is a characterisation of the variety of Lie algebras among all of varieties of non-associative algebras. To do so, we adapted the computer assisted proof from [1, 2], where another categorical characterisation of Lie algebras was given.

References

- [1] GARCÍA-MARTÍNEZ, X. AND VAN DER LINDEN, T., *A characterisation of Lie algebras via algebraic exponentiation*, Advances in Mathematics, 341, 92–117, (2019).
- [2] GARCÍA-MARTÍNEZ, X. AND VAN DER LINDEN, T., *A characterisation of Lie algebras amongst alternating algebras*, Journal of Pure and Applied Algebra, 223, 4857–4870, (2019).
- [3] GARCÍA-MARTÍNEZ, X. AND VAN DER LINDEN, T., *Algebras with representable representations*, to appear in Proceedings of the Edinburgh Mathematical Society, (2021).