Public Abstract

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Quivers are simply directed graphs. Quivers and their representations occur most naturally in representation theory of finite dimensional algebras. They turn out to have an incredibly rich combinatorial and invariant-theoretic structure. In the context of quiver invariant theory, the main objects of study are the so-called semi-stable representations. These are representations that obey certain linear homogeneous inequalities coming from the celebrated Hilbert-Mumford criterion in Geometric Invariant Theory. Semi-stable representations play a central role in the study of moduli spaces of quiver representations, but they also have applications to seemingly unrelated areas. The point of departure in this thesis is the recent work of Colin Ingalls, Charles Paquette, and Hugh Thomas on the possible interactions between semi-stable subcategories for tame quivers. Their work leads to applications to the theory of cluster algebras and Artin groups. I will here extend their work and give an equivalent condition for two weights to give rise to the same semi-stable subcategory. This condition is given by a collection of cones parametrized by Schur roots. In particular, this description of recovers the results of Ingalls, Paquette, and Thomas in the case that the quiver is tame.