

# Generalized associahedra via representation theory

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For a given fan  $\mathcal{F}$ , by choosing one arbitrary normal hyperplane  $H_\alpha$  for each ray  $\alpha$ , one obtains a set of vertices corresponding to the maximal cones of  $\mathcal{F}$ , provided the vertices are in convex position. To guarantee the convexity condition, as well as to realize the dual polytope, certain inequalities must hold. This implies that certain quantities arising from the construction are positive. In order to give a realization of a generalized associahedron via representation theory of finite dimensional algebras, we use the categorification approach to the desired positivity conditions. This way, a quantity is positive as far as it measures the dimension of a nonzero vector space.

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