

# Implicitization of surfaces in $P^3$ using toric varieties

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## Abstract

Given a parameterized surface in  $P^3$ , the implicitization problem is to find the single implicit equation defining the surface. Implicitization is an important step for intersection problems in geometric modelling. I describe two methods for finding the implicit equation which exploit the monomial structure and sparsity of the parametric equations. The surface is viewed as a projection from a certain toric variety. The two techniques correspond to algebraic geometry and commutative algebra on the toric variety.