

Implicitization of tensor product surfaces with basepoints via residual resultants

Eliana Duarte Gelvez, Otto von Guericke Universität Magdeburg

Abstract: A tensor product surface is the image of a rational map $p: \mathbb{P}^1 \times \mathbb{P}^1 \rightarrow \mathbb{P}^3$. Such surfaces arise in geometric modelling and in this context it is useful to know the implicit equation of the closure of the image. In this talk I will introduce a residual resultant for $\mathbb{P}^1 \times \mathbb{P}^1$ following Gelfand, Kapranov, Zelevinski and show that it can be computed using virtual projective resolutions. Afterwards I will explain how to use the residual resultant in $\mathbb{P}^1 \times \mathbb{P}^1$ to compute implicit equations of tensor product surfaces. Many examples and concrete computations will be presented.