

On The Problem Of Intersecting Algebraic Surfaces Using Geometric Algebra

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Abstract. Abstract goes here...

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1. Introduction

The intersection of two algebraic surfaces of the same dimension may be realized in different ways. A natural realization of such an intersection would simply be that of an algebraic surface, real or imaginary, of dimension one less than those taken in the intersection. In [], the intersection of quadratic surfaces are found as parametric curves through space. In this paper, however, we will attempt to realize the intersection of two algebraic surfaces as a reinterpretation of a given characterization of the intersection with what may be considered its canonical characterization.

For example, suppose we wish to realize a conic section given as the intersection of a plane and a conical surface. If we know enough about this intersection to begin with, then we may be justified in reinterpreting this intersection as that of a plane and an elliptical cylinder whose axis meets the plane at a right angle. The benefit of doing so is in noticing that the latter characterization of the given intersection lends itself to analysis through decomposition. That is, we can easily break the canonical form of the intersection down into its characteristic parts; which parts, collectively, help us realize the intersection as, in this case, the foci and orientation of the ellipse that is the intersection of the elliptical cylinder and the plane. By this analysis we have effectively found the intersection as it was originally given to us.

The rest of this paper will now begin exactly where the first section¹ of [] ended, and so it is assumed that, before continuing on, the reader has become familiar with all terms and definitions given in that section.

2. Further Developments Of Our Model

What has been given thus far in [] is a general model of geometry based upon a geometric algebra \mathbb{G} . Continuing with this model, we wish here to develop it further for the purpose of finding intersections as described in the introductory section. To that end,

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¹The reader need not read all of []; just the first section.