

Eckhard HITZER

International Christian University, Japan

*Three-Dimensional Quadrics in Hybrid Conformal Geometric Algebras
of Higher Dimensions*

Abstract

This presentation explains how three dimensional quadrics can be defined by the outer products of conformal geometric algebra points in higher dimensions. These multivector expressions code all types of quadrics in arbitrary scale, location and orientation. Furthermore, a hybrid approach allows the use of the standard intersection operations, and standard versor operators (scaling, rotation, translation, inversion, reflection). Both the new theory and a viable computational implementation will be explained in detail. *Note:* The results are based on an ongoing collaboration between International Christian University (Tokyo, Japan), Universite Paris Est (France), Universite de Poitiers (France), University of Essex (UK) and National Institute of Informatics (Tokyo).