



Projective Geometric Algebra TUTORIAL

Do you use, or would you like to use, **geometric algebra** (GA) to do **euclidean geometry**? Have you wondered what's the **easiest way** to achieve this goal? If so, then this **tutorial** is for you! You'll learn about the **projective model** of euclidean geometry -- a **small, powerful version** of geometric algebra **optimized** for euclidean geometry. It provides **all the features** you expect from a geometric algebra, in a **compact** and **intuitive** form, including:

- **direct mapping** to/from euclidean space via **homogeneous coordinates**,
- access to both **meet** and **join** operators on the subspaces of euclidean space,
- **free vectors** accessible via a distinguished plane in the algebra (the ideal plane),
- **structure-preserving** isometries via **versor**-based sandwich operators,
- complete **exponential** and **logarithmic** maps between the bivectors and the rotor group,
- complete support for euclidean **kinematics** and **rigid body motion**.

The tutorial will be structured in a series of **self-contained lectures** which cover:

- the **construction**: from exterior algebra, through projectivizing, to the metric,
- **plane geometry**: practice in the algebra on the basis of **concrete exercises** in the plane,
- **euclidean space**: an overview of the elegant formulation of **screw theory** in the algebra.
- rigid body motion, non-euclidean variants, other topics (as time permits).

Prerequisites: previous acquaintance with geometric algebra, and an open mind!

Presenter: Charles Gunn, Ph. D. (Technical University Berlin)

When: August 5, 2014, 9 am - 5 pm

Where: University of Tartu, Some Building, Some Street