Numerical .NET

## Project Introduction

This is a C#.NET program for mathematical (numerical, particularly) calculation tasks. Unlike most numerical libraries, Numerical .NET starts from algebraic systems, so that all algorithms are not limited at the range of real or complex numbers. It deals with elements in algebraic sets, using the very operational rules in which is defined, instead of real or complex numbers and ordinary operators.

In common package, various interfaces are provided as the definitions of fundamental algebraic structures (such as groups, rings, fields, linear sets, relational sets and etc.). Further structures could be defined by inheriting these interfaces. For example, an invertible matrix set is a field, and it’s also a normed, metric linear space with inner product operation. So we can define it by inheriting interfaces IField, ILinear, INormed, IMetric, and IInnerproducted.

With this definition system, our algorithms’ parameters could be defined as an abstract type, instead of the naive types like “double”, “complex”, “vector” and “matrix”.

## Functions

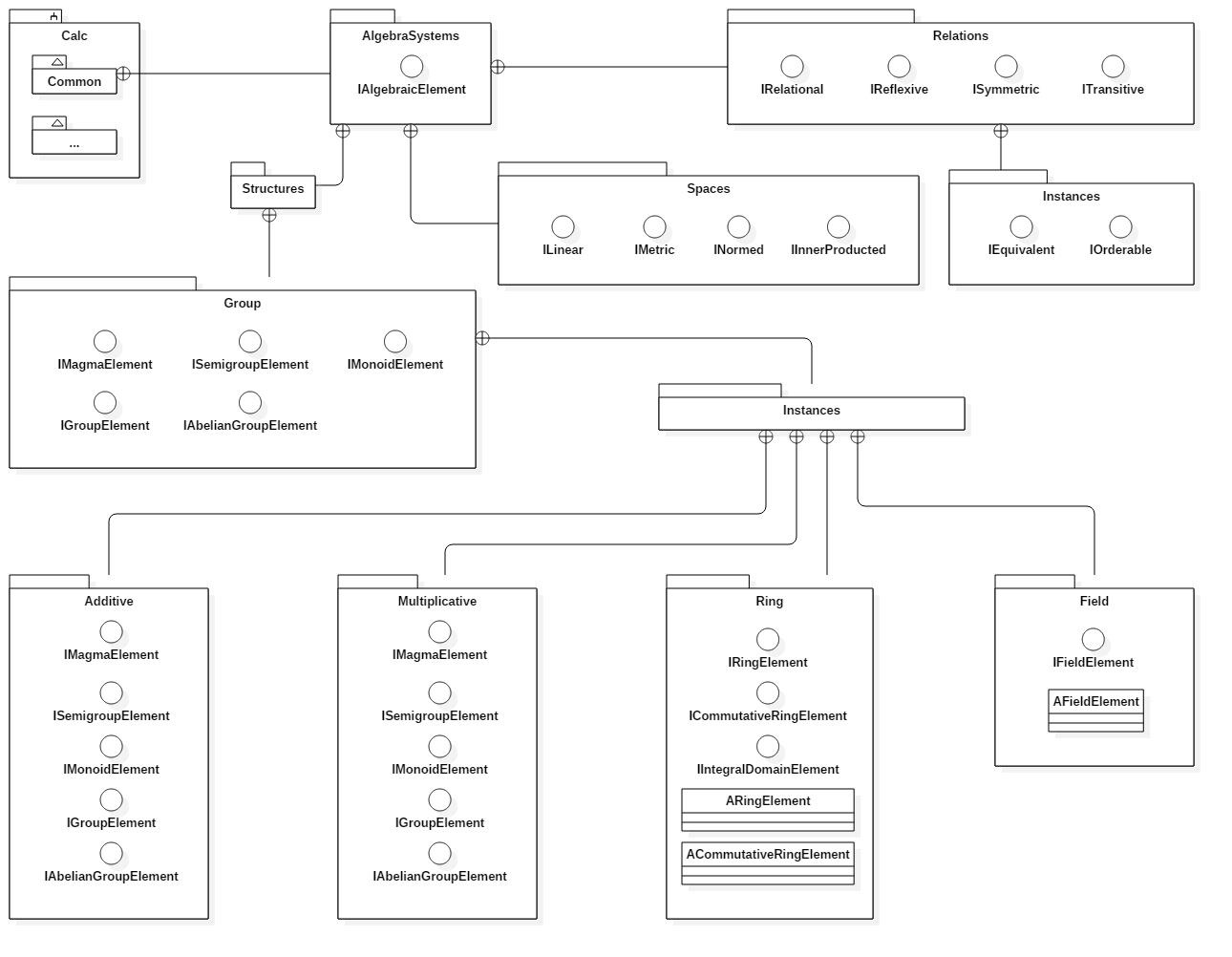
Hyper abstract data type definition structure.

Numerical algorithms suitable for abstract types.

Calculation algorithms more than numerical.

## Design

UML diagram - Packages in model “Common”



UML diagram – Interfaces in model “Common”

