Parallel & Distributed Computing: Lecture 3

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2. PLaSM crumbs

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5. If approved, the student project is pushed to the starting repo.

Plasm.jl and LinearAlbebraicRepresentation.jl

www.plasm.org

Geometric Programming: A Programming Approach to Geometric Design

https://github.com/cvdlab/Plasm.jl

https://github.com/cvdlab/LinearAlbebraicRepresentation.jl

Plasm.jl extensions IDEAS

Currently used only for visualization of geometric models (cellular complexes)

Possible project tasks

Recuperate the Backus' programming at Function Level, in a parallelized environment (either on Multicore CPUs or GPUs)

LinearAlbebraicRepresentation.jl IDEAS

Dimension-independent modeling of cellular complexes and geometric assemblies

Possible project tasks

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Dimension-independent modeling of cellular complexes and geometric assemblies

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- Optimize/parallelize some existing functions
- Extend the library with spline curves and surfaces (functions defined piecewise by polynomials)
- Complete the optimal Boolean operations implementation

PLaSM crumbs

design language PLaSM

PLaSM is a geometry-oriented extension of a subset of FL

FL Language

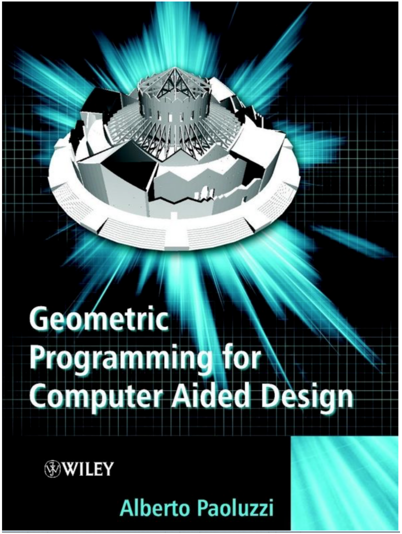
FL (programming at Function Level) is a language developed by the Functional Programming Group of IBM Research Division at Almaden (USA) [BWW90, BWWLA89]. The FL language, on the line of the Backus' Turing lecture [Backus78] introduces an algebra over programs and has an awesome expressive power.

PLaSM Language

PLaSM, (the Programming LAnguage for Solid Modeling) is a “design language” for geometric and solid parametric design, developed by the CAD Group at the Universities “La Sapienza” and “Roma Tre” [PS92, PPV95]. The language is strongly inFLuenced by FL. With few sintactical differences, it can be considered a geometric extension of a FL subset.

GP4CAD book

A. Paoluzzi, Geometric Programming for Computer-Aided Design, Wiley, 2003. (free download from `uniroma3.it` domain)



Pyplasm.jl

PLaSM was implemented in Common Lisp, Scheme, Python & C++

Current implementation is pyplasm

- download Python 3.6 from Anaconda3

run julia 0.6

```
julia> Pkg.clone("https://github.com/cvdlab/Plasm.jl")
julia> using Plasm
julia> using PyCall
julia> @pyimport pyplasm as p   # python interface to C++ kern
julia> p.VIEW(p.CUBE(0.5,0.5,0.5))       #testing C++ viewer
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- run the file `install_plasm.jl` here

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LAR crumbs

Go explore the package

https://github.com/cvdlab/LinearAlgebraicRepresentation.jl

git clone or fork

```
$ git clone https://github.com/cvdlab/LinearAlgebraicRepresent
```

add via the package manager to jour Julia environment

```
$ Julia

julia> Pkg.add("LinearAlbebraicRepresentation")
julia> using LinearAlbebraicRepresentation
julia> Lar = LinearAlbebraicRepresentation
help>  LinearAlbebraicRepresentation. <tab> <tab>
```

Look at the documentation

```
julia> Pkg.add("Documenter")
```

on the local LinearAlbebraicRepresentation.jl repo

```
$ cd <repo>/docs
$ julia6 make.jl          % julia 0.6

$ open build/index.html
```

look at the package documentation including internal docs of package functions.