Nov 2013 – nov 2014

TERRIFIC (European project)

In charge of the « reparameterization » issues

- **Achieved tasks :**

  - **Surface fitting** process (~ 6 months)
    Improved distance error computation method (PD / TD / SD)
    Developed edges fitting method
    Developed iterative projections parameterization and fitting technique using Coons patch, barycentric patch and B-spline closest point function
    Designed barycentric parameterization technique + wrote theoretical documentation
    Wrote user manual and delivery documents

  - **Curve fitting** process (~ 1 month)

  - **Offset process** (~ 3 months)

  - **Silhouette process** (contributions)

  - Galaad bspline logo.gif

- **Programming languages, libraries, versioning tools and OS :**

  - C++, Matlab (prototyping)
  - Eigen, Qt, Gotools
  - Git
  - Linux

- **Collaborations and partnerships :**

  - Bernard Mourrain, Laurent Buse
  - Missler software plc, Josselin Cauchois, Jean-Claude Morel

- **Main achievements**

  - The fitting process we developed in Axel will be embedded / included in the next version of Topsolid (Missler CAGD software) :

"The first experimentation was to demonstrate the capabilities to connect a prototype implementation (written in C++) by the academic partner Inria into the industrial framework of

TopSolid developed (in C#) by Missler software. In the D 4.4 the experimentations of a prototype of the iso-parameterization algorithm have been conducted on a real CAD model. The results of this computation were used to control a machining tool, which manufactured the corresponding metal object. The final computed geometry was satisfactory, since a geometric gap of less than 1 µm has been achieved.[…] The timing for the whole process, including the meshing part and the fitting part, has been significantly reduced. The quality of the fitting surface has been improved, by removing the oscillation effects and by including a special treatment of the boundary edges. The tested parts show that we can get some good results in a reasonable computing time. The method allows to produce tool paths of better quality and thus to improve the quality of the manufacturing process. We definitely believe that the methodology can be used in further industrial CAD/CAM applications."

- Iterative projections fitting method :