

Numerical Grid Generation Wiktionary: Structured Knowledge for Research and Education

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Abstract

In this paper we present the current extended version of the Numerical Grid Generation Wiktionary (NGGW). This is an online dictionary under development on a MediaWiki collaborative platform as an open access free tool for research and education in numerical grid generation [1]. We present and discuss the criteria we are testing to structure knowledge of the grid generation field and we describe the current state of the NGGW scientific content.

The development of NGGW was born under the support of the European Atelier for Engineering and Computational Sciences (EUA4X), a three-years Marie Curie Project [2]. In EUA4X it seemed very useful creating a dictionary of the numerical grid generation, crucial research area for a large spectrum of application fields [3].

In the last years information organization and communication have been getting faster and wider and many knowledge bases are available for worldwide communities. According to this trend a collaborative site for structuring NGG knowledge has been designed and implemented at IAC, in Media Wiki environment.

We present the current advanced version of the Numerical Grid Generation Wiktionary (NGGW), we illustrate the knowledge structuring criteria we assumed to identify scientific contents, to define an appropriate set of *categories* as its semantic aggregates and provide useful navigation aids [1] and we show the NGGW user interface and its user friendly collaborative access. The actual main categories can be referred to the following knowledge content sets [4]:

- the set A of categories which characterize the Numerical Grid Generation as an independent field of research: *Algebraic grid generation, Differential Grid Generation, Grids, Grid Optimization Methods, NGG, NGG books, NGG community, NGG events, NGG software, Parallel Grid Generation, Variational Grid Generation*;
- the set B of categories which characterize the Numerical Grid Generation Wiktionary as a collaborative knowledge environment and an active forum: *NGGW community, NGGW content organization, NGGW external connections*;
- the set C of sciences providing fundamental concepts and approaches to NGG theory: *Computer science, Geometry, Mathematics*;

- the set D of sciences providing fundamental concepts and approaches to NGG enabling technology: *Scientific Computing, Scientific Visualization, Technology*;
- the set E of application fields exploiting NGG knowledge for advances: *Application Fields, Computational Fluid Dynamics, Mechanics, Micro-magnetism, Physics*;
- the set F of information coming from past and current evolution of scientific thinking and from communities in someway linked to NGG: *History, Persons, Society, Scientific Associations*;
- the set G of categories providing information about available reference tools widely used for scientific knowledge organization: *Linguistics, Knowledge organization, Knowledge resources*;
- the set H of service categories: *Pages for deletion, Templates*.

We list each category in a set of pertinence even if a few categories could be placed in more than one set. The category *Scientific visualization*, for instance, which both provides visualization techniques to the use and development of grid generation methods and tools, and requires powerful discretization approaches to advance its capabilities, should appear not only in set D but also in E .

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