Charter for the Translators group within the European Materials Modelling Council

Materials modelling used to solve industrial problems

Background

The gap between fundamental research and successful industrial innovation is commonly called the innovation valley of death. Bridging this valley quite often calls for tailored materials to be developed as fast as possible and this is the point where modelling and simulation can make a difference to the usually used trial and error approaches. However, industrial "end-users" often lack modelling expertise, which prevents them from using simulation tools.

Therefore, within the EMMC the group of Translators was formed, with the focus on translation of industrial problems into materials modelling cases.

Scope

Translators have the ability to analyse the industrial problem, to estimate the economic advantage of simulation as tool for solving (parts of) the industrial problem and to propose modelling workflows to solve (parts of) the problem.

The translator should have the ability to adapt the workflows, when needed/required, to the daily business of industrial clients.

Translators will facilitate the training of industrial personnel (via pointing out dedicated workshops/training sessions) in order to maximize the utilization of modelling and simulation in industry.

Who can be a translator?

Translators can be found in (commercial) research institutes and consultancies, but also academic modellers and employees at software companies and at manufacturing industry often do translation.

Objectives

- Discuss, define and agree on the Translator Role and Code of Conduct which reflects what industry can expect from a Translator
- Collect translation practices and successful show cases from various translators performing translation for big companies and for SMEs,
- Outline translation methodologies to be documented in a Guide for Translators
- Create a database of Translators, to be used as part of the database of providers (translators, tools and simulation services) which will in due course be available in the

Modelling Market Place (MMP) under development.

- Stimulate the functioning of the Translators, via bottom-up activities like training workshops for translators and provision of policy input to funding schemes (EU, national, international,…)

Work plan

The Translators team is addressing the following topics:

Code of Conduct for Translators

Translators provide a service to the industry. This requires that industry should know what to expect from a Translator. Therefore the skills and the profile of the Translator will be defined in a Code of Conduct for Translators.

Initial considerations for a Code of Conduct are:

- The Translator works on the interface between business and R&D during all stages of the development (design, testing, up-scaling, market introduction).
- Translators should focus on the industrial problem. Before any possible modelling workflows or simulation cases are proposed, a full understanding of the problem and its industrial context is necessary
- The Translator will help to make the balance between investments (resources and expertise) and expected return.
- The Translator is expected to give neutral advice and third parties might be involved in the implementation of the modelling workflow.
- To do this job the Translator should be knowledgeable in the use of the four different materials models (electronic, atomistic, mesoscopic and continuum) and on expected accuracy of modelling efforts.
- Translators also need a broad economic background to advice on costs and time to solution.
- Technical and economic aspects are both important in business decisions. Therefore the translators can make use of the results and the tools developed through the integration of materials modelling in the Business Decision Support Systems (BDSS) to balance them.
- Translation can happen 'internally' when it is operating within big companies or 'externally' (an expert working with large company or with SMEs).
- Modelling requires input of data from the industrial stakeholder. The quality of this input needs to be in accordance with the proposed workflow/simulation case and this is to be addressed by the Translator. Confidentiality issues of industrial data are a key point.
- Translators should be free from self-interests. A proposed solution for the industrial problem should not reflect the Translators favorite models, methods or software tools.
- In a particular project, Translators should not be part of the team providing a solution. During a project, the Translators serve as a representative of the industrial stakeholders.
- Translators support the implementation and utilization of modelling and simulation by enhancing the skills of the industrial operators. This is best accomplished by adapted training efforts.

Translation methodologies
The Translators will exchange their best and worse practices in translation. This will help identifying the best scenarios for implementation of modelling workflows, learning from the worst practices. Translators from different countries will be given opportunity to share their experience on national level with colleagues across Europe, via EMMC wiki and/or via group chats and translators on-line meetings/workshops. Industry sector oriented Translation workshops for industry might be supported by the EMMC.
As an outcome of the Translators discussions and workshops/meetings, a User Guide for Translators will be prepared describing the possible scenarios for the translation, including a strategy for the training of industrial operators. This guide will be instrumental in building awareness and confidence in applying modelling for a broader adoption, in particular by small medium enterprises (SMEs).

Industrial end user mapping and conducting "Translation Experiments"
Each industrial sector has its own specific needs. An initial mapping of this landscape will be done in close collaboration with all teams in the council. Based on the developed Translators User Guide and Translation methodologies, tailor made Translation experiments can be conducted with interested industrial stakeholders from different sectors, as new or within running projects. Due to the subsidiarity principle these will not be funded by the EU.

Industrial Case studies
The EMMC will set up a collection of non-confidential industrial case studies of best practice in using modelling for solving (parts of) certain industrial problem, as industry is best motivated to adopt modelling "if the competitor is also doing this". These successful modelling show cases will be used by the Translators to demonstrate the possibilities of modelling as a tool.

It is hoped that in the near future all the above aspects of translation will be supported by an Open Translation Environment (OTE) soon to be developed. Such an OTE will allow improved decision making for materials producers on the level of differentiating materials and processes by giving fast access to information and thereby allowing the industry to react fast to changing feedstock, markets and regulatory demands.

Next steps

- Expert meetings (May-September 2017) to refine the profile/role of the translator, documented in the Code of Conduct (finalized by end 2017)
- Collection of Translation Cases, to be used as input for the Guide for Translators (to be finalized by end 2017)
- Participation in the EU translator workshop for national Translators in Sept 2017 in Brussels to harvest and digest the necessary case studies from which best practice can be taken.
- Organization of modelling/translation/training sessions and presentations at different events (June 2017 – June 2018)
- Organisation of workshops to train the translators on the technical (together with CECAM) and economic aspects of modelling.
  EMMC, the European Materials Modelling Council, brings together all stakeholders in

materials modelling. www.emmc.info
CECAM, based in Lausanne, is a European association supported by 23 research organisations holding workshops on discrete materials modelling.
https://www.cecam.org