Grant Agreement No.: 604656

Project acronym: NanoSim

Project title: A Multiscale Simulation-Based Design Platform for Cost-Effective CO_2 Capture Processes using Nano-Structured Materials (NanoSim)

Funding scheme: Collaborative Project

Thematic Priority: NMP

THEME: [NMP.2013.1.4-1] Development of an integrated multi-scale modelling environment for nanomaterials and systems by design

Starting date of project: 1st of January, 2014

Duration: 48 months

Document ID: NanoSim-WP4-D4.6_Deliverable_TrainingMaterialCOSI_C3PO

WP N°	Del. N°	Title	Contributors	Version	Lead beneficiary	Nature	Dissemin. level	Delivery date from Annex I	Actual delivery date dd/mm/yyyy
4	D4.6	Training Material for COSI and C3PO	Authors: Thomas Forgber, Federico Municchi, Stefan Radl Checked by: Stefan Radl	1.0	TUG	Report	PU	31/12/2015	30/12/2015

1 Introduction

This document summarizes the training material resources that are made available to the public for the co-simulation platform "COSI", as well as the tool "CPPPO". Despite not mentioned explicitly here, the links contained in this document also hints to (i) course material, as well as (ii) software documentation. These documents may also help new users to become familiar with the software, and use it in an efficient manner. Note that software documentation is typically available with the software, and for "COSI", as well as "CPPPO" is provided via https://github.com/CFDEMproject.

1.1 Document identification

Document Identification	TRAINING_MATERIAL
Author(s)	Thomas Forgber, Federico Municchi, Stefan Radl
Reviewers	Stefan Radl
Manager	Stefan Radl (TUG)
Version of the Product	1.0
Version of Software	see https://github.com/CFDEMproject

1.2 Scope

The COSI platform is used to simulate fluid-particle flows, either with or without chemical reactions. COSI is a co-simulation tool that allows to connect intra-particle transport phenomena with particle and fluid motion physics.

CPPPO is used to filter DNS data from the generic particle/fluid solver. Filtered data are then used to develop closure models for heat and mass transfer to be used in CFD-DEM simulations. These models are in the form of a particle-based dimensionless transfer coefficient, e.g. Nusselt or Sherwood number.
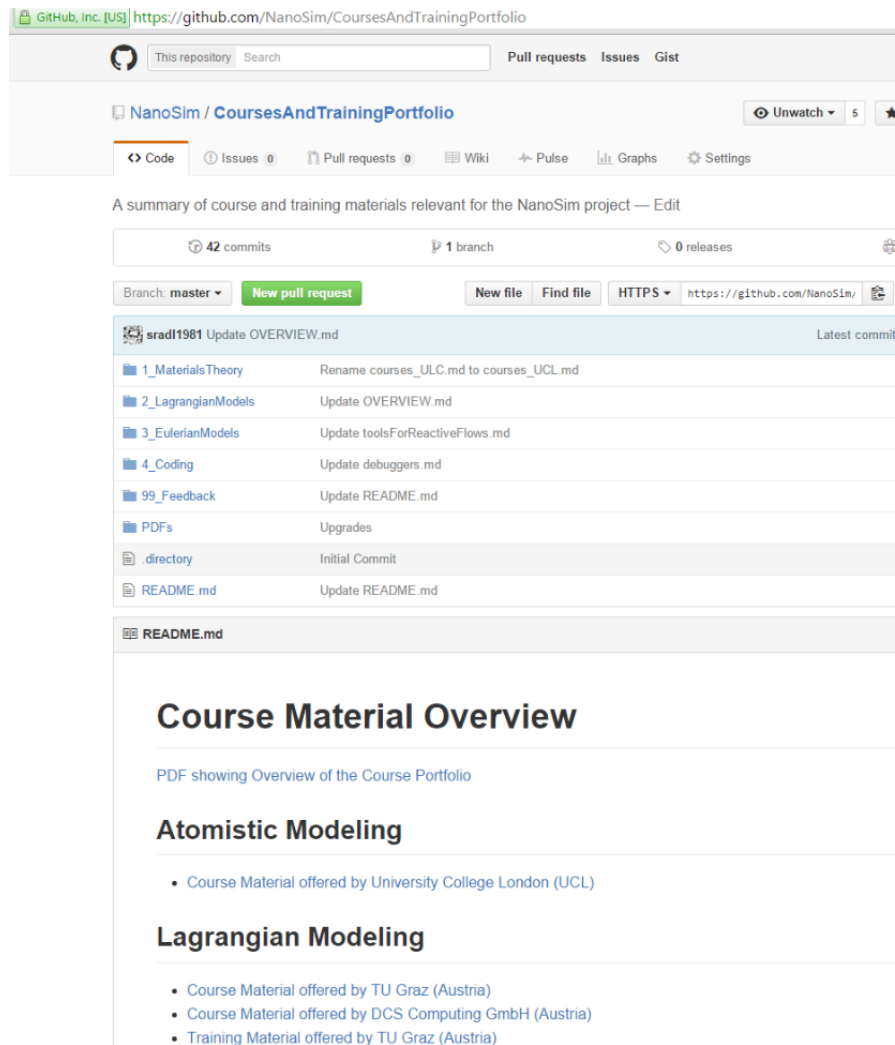
As specified in task 4.9 of the DOW, TUG will provide educational resources in order to guide new users of the COSI platform, as well as of the CPPPO.

1.3 References

Acronym	Name
DOW	Description of Work (Work Package 4)
OPH-TM	Online Project Hosting Training Material (https://github.com/NanoSim/CoursesAndTrainingPortfolio)
COSI	The open-source CO-Simulation platform for fluid-particle systems
CPPPO	Compilation of fluid/Particle Post Processing routines

1.4 System Overview

The training material produced before, during, and after the NanoSim project is hosted on different servers of the partners. Also, there is already a significant amount of training material available for sub-parts of COSI (e.g., for OpenFOAM®, or meshing tools). To provide a single point of access of all relevant training resources, a "Course Material Overview" has been established at OPH-TM. To access the resources, the user may want to simply navigate to the OPH-TM webpage, and click on one of the links in a relevant sub-section (the sub-sections are structured according to the work packages in the NanoSim project, as well as by partner).
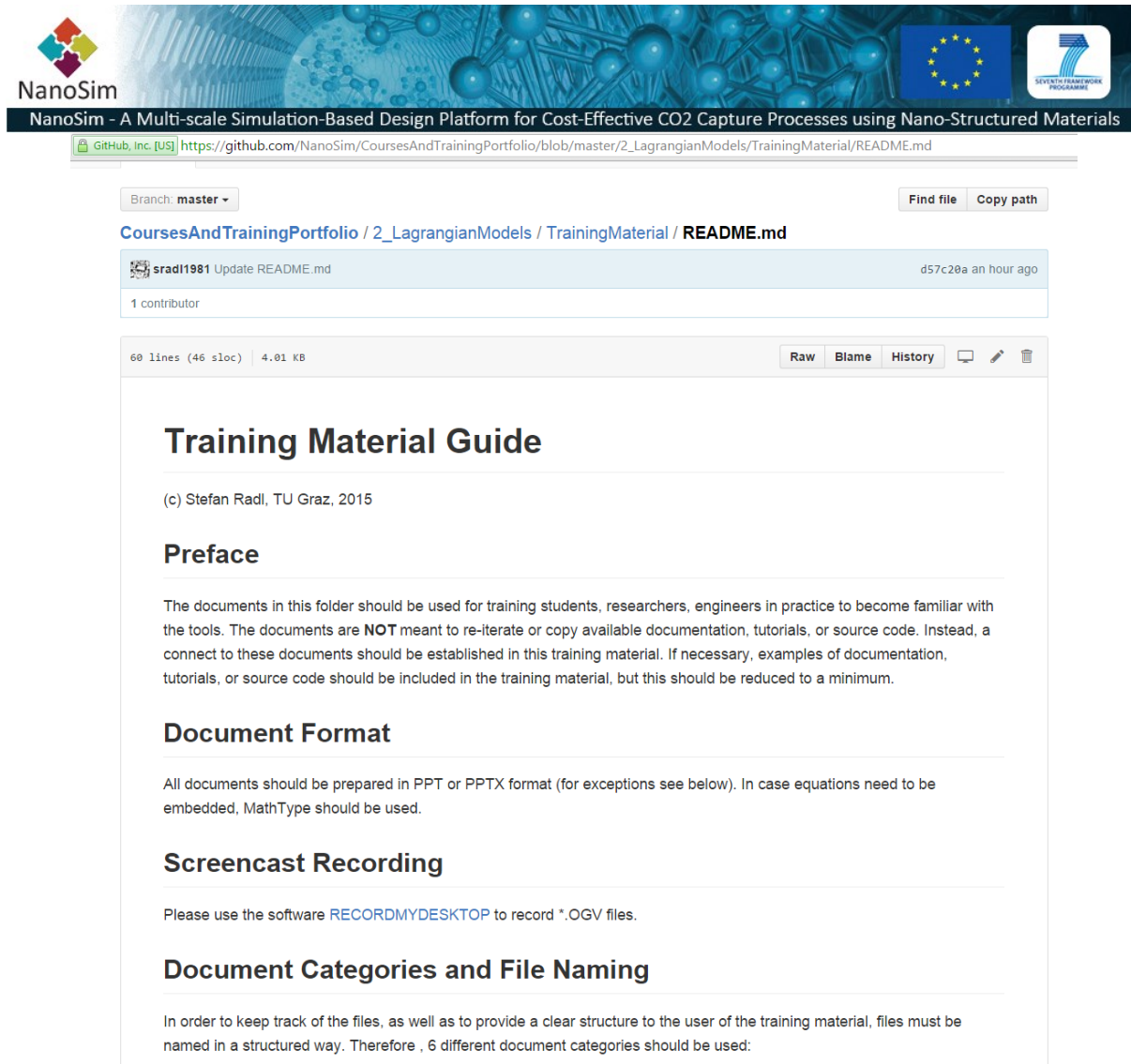
Figure 1: Course Material Overview on OPH-TM.

The material made available via OPH-TM is structured into

- "Course Material": this material may be used during University teaching courses, as well as
- "Training Material": this material is more specific to a software tool, and contains only basic theoretical background.

In order to guide the future addition of training material, a training material guide has been setup, and is available via:

https://github.com/NanoSim/CoursesAndTrainingPortfolio/blob/master/2_LagrangianModels/TrainingMaterial/README.md

Figure 2: Training Material Guide available via OPH-TM.

1.5 Organization and Responsibilities

TUG was responsible for documentation, and review of the training material prepared for the tools "ParScale", and "CPPPO". Other training material hosted on OPH-TM has been prepared before the NanoSim project by TUG, or has been made available by other partners / external organizations.

2 Appendix

2.1 Glossary

See List of definitions and abbreviations in Section 1.3

2.2 Document Change Log

Date	Description	Author(s)	Comments
30.12.2015	Initial version	Stefan Radl	