NTNU

Norwegian University of Science and Technology

MSCA-SE project REMODEL

Brynjulf Owren March 31, 2025
Department of Mathematical Sciences, NTNU
Brynjulf.Owren@ntnu.no

Overview

- Our previous experiences with SE projects
- Brief overview of REMODEL
- Application process
- Selected parts of the content
- Grant preparations, GA, CA, etc
- Experiences so far

Earlier experience

- Our group has had two Staff Exchanges projects earlier (CRISP and CHIPS)
- Beneficiaries: NTNU (Norway), Bergen (Norway), Chalmers (Sweden), Cambridge (UK)
- Associated partners: La Trobe, Melbourne (AUS), Massey, Palmerston North (NZ)
- Subject: Structure preserving numerical methods for differential equations

Our former staff exchanges projects

Project	Instrument	FP
CRISP	IRSES	FP7
CHIPS	RISE	Horizon 2020
REMODEL	SE	Horizon Europe

REMODEL (Overview)

- Research Exchanges in the Mathematics Of Deep Learning with applications
- Main idea: Investigate deep learning algorithms from a mathematician's viewpoint and apply the results to relevant problems through interdisciplinary collaboration with engineers
- Partners: University of Bath, University of Cambridge (UK), TU Eindhoven (NL), NTNU (NOR), Emory University (USA), Simon Fraser University (Vancouver, CAN), Kobe University (JP)

Partners of REMODEL

EU/EEA

NTNU (NOR)

TU Eindhoven (NL)

Associated Partner

University of Bath (UK)

Cambridge Univ. (UK)

Emory Univ. (USA)

Kobe Univ. (JAP)

SFU (Can)

Application process

- Concept development. Forming a consortium.
- Contact potential partners
- Writing process according to template
- Develop Work Packages
- Define Deliverables, Secondment scheme, and other necessary ingredients of the application.
- Got comments on early draft
- The overall responsibility for putting the proposal together was taken by NTNU, we got help with the scientific details and for proof reading by all partners
- Planning of secondments also involved all partners
- Important point: Secondments within Europe have become possible, but due to some restrictions (intersectoral/interdisciplinary + extent)

To keep in mind

- If you are leading the work, you cannot be careful enough to give information to partners about rules, intentions behind call, what can and cannot be done etc
- Examples:
  - Funding for secondments is a flat rate
  - Secondments for beneficiaries are still primarily for outside Europe
  - Be clear about the minimum duration of a secondment, destination is not negotiable, requirements for documentation
  - Funding must be returned to the EU for granted secondment months that have not been used
  - EU pays only for secondments **out**, not for visitors to beneficiaries (except from low-income countries)

Concept development – forming the consortium

- The concept (Mathematics for deep learning) was proposed by NTNU, where initial ideas about what it could entail were developed
- Next, we identified 7 possible university partners
- This was based solely on familiarity with people and knowledge of their areas of expertise
- 6 of the 7 accepted invitations to become a part of the consortium
- We looked into possible industrial partners to work with, but we started a little too late to succeed with this

Developing Work Packages

- This work was done in close collaboration with all partners in the project
- Two administrative and six scientific WPs were proposed
- 8 Work Packages (WPs) were identified, 6 of them scientific.
- NTNU took charge of the two administrative WPs
- Each of the six other WPs was assigned a “Lead partner”. Each of them was given a lot of freedom in designing the WP and describing the content
- Distributing responsibility was found to be an important way of ensuring ownership to the project

Work packages

- WP1. Project coordination and management
- WP2. Structure-preserving deep learning for dynamics discovery and physical simulation acceleration
- WP3. Enhanced and adaptive sampling strategies for deep learning in scientific computing
- WP4. Generative modeling with diffusion and flow matching
- WP5. Structure-preserving deep learning for image analysis
- WP6. Differential equations and equivariant neural networks
- WP7. Model order reduction
- WP8. Dissemination, exploitation and communication of results

Other notable planned activities

- Mathematics Meets Industry (WP8). This is a networking activity primarily aimed at PhD students. Includes career planning activities, exchange of ideas for innovation, etc.
- MaGIC. A workshop held in Norwegian mountains, an event where new PhD students can practice to give talks in a “friendly environment”.
- Generally, workshops are organized in connection with secondments.

Grant agreement

- Invitation for preparing Grant Agreement: May-26-2023.
- The precise timeline was given by the EU, but the process was a little delayed due to uncertainties about the role of the UK.
- The PO was of great help to us in this period
- The GA was ready to be signed Oct-11-2023.
- It has been somewhat unfortunate for the project that the two UK universities got status as “Associated partners” and not “Beneficiaries” as opposed to what was planned.

Consortium agreement

- Must be signed between partners in the consortium; it is not an official EU document.
- For various reasons, we were significantly delayed in having this document signed by all partners
- In retrospect, we could have started earlier to prepare for the completion of the CA

Experiences with REMODEL so far

- We are now 1.25 years into the project.
- We have had many activities so far, including about 25 beneficiary secondment months, these have been successful
- A significant part of secondments have been by ESRs, but also some by professors, and more to come
- We have been able to organize workshops and are in the process of planning Math Meets Industry.