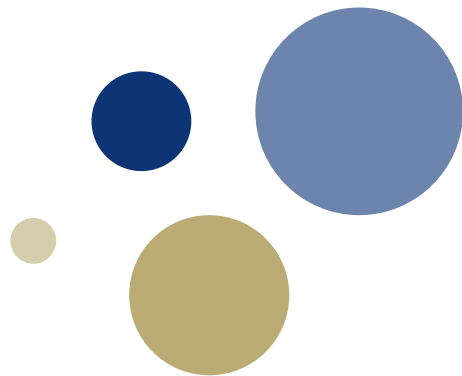




Norwegian University of
Science and Technology



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.