ROMSOC

Reduced Order Modelling, Simulation and Optimization of Coupled systems

Personal Career Development Plans for all ESRs

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Abstract

In the ROMSOC project continuous career development strategies for the Early Stage Researchers (ESRs) are set up in order to enhance the career perspectives and employability of the recruited fellows to many public and private sectors (involving industry and research institutes). An intensive and highly qualified supervision and mentoring program, as well as the network-wide training activities contribute to the development of task-oriented research skills, generic research skills and transferable skills. The goal of the ROMSOC project is that the ESRs experience a wide range of interdisciplinary and intersectoral training to enable them to become professional workers and to take responsibility for their project and career management, while reflecting on their own skills and actively pursuing their own training needs.

History of Changes

Version	Date	Comments, Change	Authors, Contributors
0.1	31/05/2018	First Draft	Lena Scholz
0.2	21/06/2018	Second draft, input added from C. Vergara and V. Mehrmann, abstract added	Lena Scholz Christian Vergara Volker Mehrmann
1.0	25/06/2018	Version circulated to the Training & Research Committee	Lena Scholz
1.1	31/07/2018	Small corrections, Table 2 updated	Lena Scholz

Contents

List of Beneficiaries and Partner Organizations

List of Beneficiaries:

1	Technische Universität Berlin	TUB	Germany
2	MathConsult GmbH	MathConsult	Austria
3	Johannes Kepler Universität Linz	JKU	Austria
4	Microgate Srl	Microgate	Italy
5	Consorcio Instituto Tecnolóxico de Matemática Industrial	ITMATI	Spain
6	Institut national de recherche en informatique et automatique	INRIA	France
7	Universität Bremen	U-HB	Germany
8	Bergische Universität Wuppertal	BUW	Germany
9	ST Microelectronics Srl	STM	Italy
10	Friedrich-Alexander-Universität Erlangen-Nürnberg	FAU	Germany
11	MOX Politecnico di Milano	MOX-PoliMi	Italy
12	Scuola Internazionale Superiore di Studi Avanzati di Trieste	SISSA	Italy
13	Weierstraß Institut für Angewandte Analysis und Stochastik	WIAS	Germany

List of Partner Organizations:

14	Universidade da Coruña	UDC	Spain
15	Microflown Technologies B.V.	Microflown	Netherlands
16	Université Paris Dauphine	UPD	France
17	Philips Lighting BV	Philips	Netherlands
18	Sagiv Tech Ltd.	Sagiv-Tech	Israel
19	DB Cargo Polska S.A.	DB	Poland
20	Universidade de Santiago de Compostela	USC	Spain
21	Danieli Officine Meccaniche SPA	Danieli	Italy
22	CorWave	CorWave	France
23	ArcelorMittal	AMIII	Spain
24	Humboldt Universität zu Berlin	HUB	Germany
25	Math.Tec GmbH	MathTec	Austria
26	European Service Network of Mathematics for Industry and Innovation	EU-MATHS-IN	Netherlands

List of other involved institutions:

27	Evangelische Hochschule Nürnberg	EVHN	Germany
28	Johann Radon Institute for Computational and Applied Mathematics	RICAM	Austria

1. Introduction

The ROMSOC project has the designated goal to enhance the career perspectives and employability of the recruited Early Stage Researchers (ESRs) to many public and private sectors (involving industry and research institutes) by contributing to their skills development. By embedding key aspects of expertises including task-oriented research skills, generic research skills, as well as transferable skills in the training activities, the ESRs experience a wide range of interdisciplinary and intersectoral training. It is a specific goal of the ROMSOC programme to train ESRs to be professional worker, to take responsibility for their project and career management, reflecting on their own skills and actively pursuing their own training needs.

All these goals are achieved by setting up intensive and highly qualified supervision and mentoring arrangements and continuous career development strategies for the ESRs as detailed in the following sections.

2. Supervision Arrangements

A high quality of the supervision arrangements in the ROMSOC project is ensured, since all lead scientists at the participating academic organizations have long-term experience in supervising PhD students, PostDocs, as well as master students. Several of these students were or are involved in industrial collaborations and in research topics related with industrial applications of different kind. In the ROMSOC project, each ESR has a lead supervisor and at least one (but in many cases several) co-supervisor(s) coming from different institutions and from different sectors (academic and industry). Besides the lead supervisor and co-supervisor(s), each ESR is assigned a mentor coming from a different academic institution within the ROMSOC network. This joint supervision and mentoring of each project ensures a multicultural, multidisciplinary, and translational element to the training activities inside ROMSOC.

The role of the lead supervisor is to assist the ESR in his/her continuous professional development. By regular meetings with the ESR and by providing feedback, fast progress in the research is stimulated. The lead supervisor is also responsible for the organization of exchange visits to other researchers within and outside the ROMSOC network, since such visits will widen the scientific horizon of the ESRs and help to built up his/her own network of researchers.

The role of the co-supervisors is to jointly supervise the ESR towards the successful completion of his/her PhD and to assist the lead supervisor with advising the ESR in technical areas and monitoring the quality of outputs. While the lead supervisor is from the academic sector, at least one co-supervisor for each ESR is from the industrial sector.

The role of the mentor is to act as contact person for additional support (scientific and non-scientific) and to give additional career guidance for the ESR (often from a different perspectives). The possibility of meetings between ESR and mentor will be arranged at all project meetings to allow the ESR to discuss the progress of his/her research work or other related issues or problems.

The joint supervision and mentoring arrangements for the ESRs in ROMSOC are summarized in Table 1.

In the Consortium Agreement the organizational structure of the ROMSOC project is settled to comprise the *Supervisory Board* and the *Training & Research Committee* as governing bodies of the consortium. Both bodies are responsible to oversee the quality and quantity of supervision of the ESRs. Moreover, the Training & Research Committee is also responsible for overseeing the quality of the network-wide training of ESRs and for ensuring that scientific/technological training is balanced with transferable skills training appropriate to the needs of each recruited ESR. The network-wide training activities in ROMSOC are summarized in Table 2.

It is the responsibility of the *Training Programme Lead* (Christian Vergara at MOX-PoliMi) to assign the mentors for the ESRs (in consultation with all involved parties), to encourage the ESRs in an active career management, and to monitor the training aspects.

ESR No.	Academic Supervisor(s)	Industry Supervisor(s)	Mentor
ESR1	**Ronny Ramlau** (JKU) Andreas Neubauer (JKU) Stefan Kindermann (JKU) Victoria Hutterer (JKU)	Roberto Biasi (Microgate) Mauro Manetti (Microgate) Christian Patauner (Microgate)	Jean-David Benamou (INRIA)
ESR2	**Andrés Prieto Aneiros** (ITMATI, UDC)	Daniel Fernández Comesaña (Microflown)	Peregrina Quintela Estévez (ITMATI)
ESR3	**Jean-David Benamou** (INRIA)	Wilbert IJzerman (Philips Lighting) Gilles Vissenberg (Philips Lighting)	Michael Hintermüller (WIAS)
ESR4	**Peter Maass** (U-HB) Tobias Kluth (U-HB)	Chen Sagiv (SagivTech)	Ronny Ramlau (JKU)
ESR5	**Michael Günther** (BUW) Jan ter Maten (BUW) Andreas Bartel (BUW)	Angelo Ciccazzo (STM)	Volker Mehrmann (TUB)
ESR6	**Volker Mehrmann** (TUB)	Andreas Binder (MathConsult)	Gianluigi Rozza (SISSA)
ESR7	**Alexander Martin** (FAU) Andreas Bärmann (FAU)	Marek Staszek (DB) Hanno Schülldorf (DB)	Peter Maass (U-HB)
ESR8	**Peregrina Quintela Estévez** (ITMATI, USC) Gianluigi Rozza (SISSA)	Gianfranco Marconi (Danieli)	Christian Vergara (MOX-PoliMi)
ESR9	**Christian Vergara** (MOX-PoliMi)	Pier Paolo Monticone (CorWave) Luc Polverelli (CorWave)	Michael Günther (BUW)
ESR10	**Gianluigi Rozza** (SISSA) Peregrina Quintela Estévez (ITMATI, USC)	Alejandro Lengomin (AMIII) Tomás Símaro (AMIII)	Andrés Prieto Aneiros (ITMATI)
ESR11	**Michael Hintermüller** (WIAS)	Karl Knall (MathTec)	Alexander Martin (FAU)

Table 1: Joint supervision and mentoring arrangements (lead supervisors in bold font).

	Mandatory Training Courses	Lead	Dates	Venue
MTC-1	Multiphysics modelling	ITMATI	25 Jun–06 Jul 2018	USC, Santiago de Compostela, Spain
MTC-2	Advanced Programming for Scientific Computing	MOX-PoliMi	22 -26 Oct 2018	MOX-Polimi, Milan, Italy
MTC-3	Advanced Numerical Topics: PDEs	SISSA	15-18 Apr 2019	SISSA, Trieste, Italy
MTC-4	Mixed integer linear and nonlinear optimization	FAU	Spring 2019	FAU, Erlangen, Germany

	Elective Training Courses	Lead	Dates	Venue
ETC-1	PDAE modelling and simulation	BUW	15-19 Oct 2018	BUW, Wuppertal, Germany
ETC-2	Numerical methods for fluid-structure interaction	MOX-PoliMi	14-18 Jan 2019	MOX-Polimi, Milan, Italy
ETC-3	Hierarchical energy based modeling	TUB	27 -31 Aug 2018	TUB, Berlin, Germany
ETC-4	Introduction to Information-Based Complexity	JKU	29 Oct - 2 Nov 2018	RICAM, Linz, Austria
ETC-5	A Numerical Introduction to Optimal Transport	INRIA	Spring 2019	INRIA, Paris, France
ETC-6	Deep learning	U-HB	2019	tbd

	Transferable- and soft-skill Training Courses	Lead	Dates	Venue
TSTC-1	Communicating scientific research	MOX-PoliMi	Jan 2019	MOX-Polimi, Milan, Italy
TSTC-2	Study Groups with Industry (ESGI 139)	ITMATI	9 -13 July 2018	USC, Santiago de Compostela, Spain
	Study Groups with Industry (ESGI 147)	ITMATI	8-12 Apr 2019	USC, Santiago de Compostela, Spain
TSTC-3	Ethical aspects of the research	TUB	23-24 July 2018	EVHN, Nürnberg, Germany
TSETC-1	Gender & Diversity	local	ongoing	—
TSETC-2	Project Management & Interdisciplinary Collaboration	local	ongoing	—

Table 2: Network-wide training activities in ROMSOC (Status: July 2018)

3. Career Development Plans

A Career Development Plan has been established by each recruited ESR together with his/her personal supervisor(s) comprising the ESRs training and career development needs and scientific objectives, as well as the measures foreseen to meet these objectives and a description of his/her initial training activities. This plan also includes transferable skills and a meaningful exposure to both, the academic and the non-academic sector.

A Template for the Career Development Plan (see Appendix), agreed upon and annexed to the Consortium Agreement, was provided by the Coordinator to guide the supervisors and ESRs. The compiled plan is to be signed by both, the ESR and the lead supervisor, and includes the following sections:

1. **Long-term career objectives** (over 5 years) including long term goals and research activities/training required to attain these goals.

2. **Short-term objectives** (1-2 years) including anticipated research results (in terms of publications or events participation), research skills and techniques, plans for fellowship or funding applications, beyond-research professional skills training, and anticipated networking activities.

The Career Development Plan should also describe the enrollment in a PhD programme, proposed training visits, and the foreseen secondments. To adapt to changes and to ensure sufficient flexibility, the plans will be revisited every 6 months. Moreover, after one year, all ESRs will undergo a formal evaluation of their first year performances in their respective institutions.

The long-term goals that the ESRs set for themselves include among others the following (compilation of the Career Development Plans' content):

- becoming a post-doctoral researcher at a leading university or research institute in Europe or in the US, or in industry in the field of Modeling, Simulation and Optimization;

- attending and organizing conferences for scientific exchange along with other researchers;

- holding workshops and lectures at university for under- and postgraduate students;

- gain necessary expertise to be properly equipped for leadership roles for future technical demands;

- to be at the forefront of the research in the field of fluid-structure interaction, thermo-fluid-dynamics and reduced order modeling.

The structured and broad training programme of ROMSOC will help the ESRs to reach these goals and enables them to find high quality employment in all technology areas, or to find a matching postdoctoral position in academia. The obtained knowledge and practice experience and their skills in being able to act on the interface between industrial and academic research will enable them to become industrial leaders. The programme will also encourage interaction with other researchers in international cooperation and stimulate the entrepreneurial mindset of the ESRs due to the direct participation in laboratories of the industrial partners.

The personal Career Development Plans of the ESRs have been collected by the Coordinator. At the time of writing of this report (July 2018) nine out of eleven Career Development Plans have been made available to the Coordinator. Note that by the end of July 2018, eight of the eleven ESRs have been recruited and two more have been selected but have not signed their contracts yet (due to various reasons). For details on the ESR recruitment we refer to the "ESR recruitment final summary report" (Deliverable D7.5). The missing plans will be compiled together with the ESRs as soon as the recruitment has been completed.

A. Appendix - Career Development Plan (Template)

A Template for the Career Development Plan has been provided by the Coordinator to guide the supervisors and ESRs in compiling the personal plans for the fellows. The Template is based on the EU Template [1] and has been agreed upon by the Consortium and is also annexed to the Consortium Agreement.

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[1] http://ec.europa.eu/assets/eac/msca/funded-projects/how-to-manage/funded-projects/
how-to-manage/itn/career_development_plan.doc

Career Development Plan-Year 1
(Draft)

Name of fellow:

Department:

Name of Supervisor:

Date:

BRIEF OVERVIEW OF RESEARCH PROJECT AND MAJOR ACCOMPLISHMENTS EXPECTED (half page should be sufficient):

Long-term career objectives (over 5 years):

1. Goals:

2. What further research activity or other training is needed to attain these goals?

Short-term objectives (1-2 years):

1. Research results
    o Anticipated publications:

    o Anticipated conference, workshop attendance, courses, and /or seminar presentations:

2. Research Skills and techniques:
    o Training in specific new areas, or technical expertise etc:

3. Research management:
    o Fellowship or other funding applications planned (indicate name of award if known; include fellowships with entire funding periods, grants written/applied for/received, professional society presentation awards or travel awards, etc.)

4. Communication skills:

5. Other professional training (course work, teaching activity):

6. Anticipated networking opportunities

7. Other activities (community, etc) with professional relevance:

Date & Signature of fellow: Date & Signature of supervisor

Career Development Plan-Final year
(Draft)

Name of fellow:

Department:

Name of Supervisor:

Date:

BRIEF OVERVIEW OF PROGRESS, ACHIEVEMENT AND PERFORMANCE (half page should be sufficient):

Long-term career objectives (over 5 years):
If relevant, mention any adjustments to your long-term career objectives as a result of the training received.

Short-term objectives achieved during the training period:

1. Research results
   o Publications (incl. in press):

   o Conference, workshop attendance, courses, and /or seminar presentations:

2. Research Skills and techniques acquired:
   o Training in specific new areas, or technical expertise etc:

3. Research management:
   o Fellowship or other funding applications achieved (indicate name of award if known; include fellowships with entire funding periods, grants written/applied for/received, professional society presentation awards or travel awards, etc.)

4. Communication skills:

5. Other professional training (course work, teaching activity):

6. Anticipated networking opportunities

7. Other activities (community, etc) with professional relevance:

Date & Signature of fellow: Date & Signature of supervisor

Career Development Plan
Guidance on some of the competencies expected

The following points are a non-exhaustive series of aspects that could be covered by the career development plan, and it is relevant to the short-term objectives that will be set by the researcher and the reviewer at the beginning of the fellowship period. The objectives should be set with respect to the skills and experience that each researcher should acquire at a given time of his/her career. A postgraduate researcher at PhD level will have very different needs compared to a post-doctoral researcher at an advanced stage of his/her professional development. These objectives should be revised at the end of the fellowship and should be used as a pro-active monitoring of progress in the researcher's career.

1. Research results.
These should give an overview of the main direct results obtained as a consequence of the research carried out during the training period. It may include publications, conference, workshop attendance, courses, and /or seminar presentations, patents etc. This will vary according to the area of research and the type of results most common to each field. The information at this level should be relatively general since the career development plan does not strictly constitute a report on the scientific results achieved.

2. Research Skills and techniques acquired.
Competence in experimental design, quantitative and qualitative methods, relevant research methodologies, data capture, statistics, analytical skills.
Original, independent and critical thinking.
Critical analysis and evaluation of one's findings and those of others
Acquisition of new expertise in areas and techniques related to the researcher's field and adequate understanding their appropriate application
Foresight and technology transfer, grasp of ethics and appreciation of IPPR.

3. Research management.
Ability to successfully identify and secure possible sources of funding for personal and team research as appropriate.
Project management skills relating to proposals and tenders work programming, supervision, deadlines and delivery, negotiation with funders, financial planning, and resource management.
Skills appropriate to working with others and in teams and in teambuilding.

4. Communication skills.
Personal presentation skills, poster presentations, skills in report writing and preparing academic papers and books.
To be able to defend research outcomes at seminars, conferences, etc.
Contribute to promote public understanding of one's own field

5. Other professional training (course work, teaching activity):
Involvement in teaching, supervision or mentoring

6. Anticipated networking opportunities.
Develop/maintain co-operative networks and working relationships as appropriate with supervisor/peers/colleagues within the institution and the wider research community

7. Other activities (community, etc) with professional relevance.
Issues related with career management, including transferable skills, management of own career progression, ways to develop employability, awareness of what potential employers are looking for when considering CV applications etc.

The ROMSOC project

July 31, 2018

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