Informatics Europe Research

Evaluation of the Faculty of Informatics

of Masaryk University

Evaluation Report

I.   Evaluated unit

1. Evaluated Unit Identification

Name	FI
Faculty	Faculty of Informatics

2.   Panel/Faculty International Scientific Advisory Board members

	First and last names of the evaluators
1.	Carlo Ghezzi
2.	Sophia Ananiadou
3.	Elisabetta Di Nitto
4.	Christian Jutten
5.	Dimka Karastoyanova
6.	Friedhelm Meyer auf der Heide

3.   General Commentary

The Faculty of Informatics hosts a vibrant scientific and educational environment, well connected with the research community and with the lively technological national initiatives involving industry in the Brno area. We commend the faculty's enthusiasm for and commitment to research, which spans the broad spectrum from long term, basic research to exploration of impact in application areas and to achieving social benefits of research, especially through CERIT.

Research is generally of very good to excellent quality. In a few cases, like algorithms, formal methods, cyber-security, it is of world-leading quality.

4. Research Topics, Grants, and Impact

The faculty covers most relevant areas in Informatics through a very fragmented structure of mainly small-size laboratories (22 in total). For the purpose of evaluation, these have been clustered into 7 topics (Theory and formal methods, security and cryptography, SW/HW systems and services, Artificial intelligence, Visual computing, Bioinformatics and systems biology, Data management). The total level of funding is about 29 MEUROs in 5 years for about 56 FTE active researchers, i.e. about 100 KEUROs/FTE/year, which looks pretty low to sustain research in all areas. We are especially worried about reliance on core research funding and national funds, which are unlikely to grow, and the very limited access to international

research funds. With the notable exception of the prestigious ERC grant in the area of algorithms (which, however, has been acquired by the PI when he was not yet member of the Masaryk University), and the promising developments in the cybersecurity network of competence centres in Europe, access to competitive international research funds is far too limited. As a consequence, several laboratories are below the critical mass, both in terms of people and in terms of budget, to ensure sustainable growth of top research. This is further undermined by the fact that industry funded research is often driven by very short term objectives. The issue is additionally negatively impacted by the fact that the national funding for PhD students scholarships is too small to ensure acceptable conditions for sustainable research quantity and quality by PhD students in the laboratories.

5. Cooperation and Research Infrastructure

The strict laboratory-based structure of research activities raises concerns in terms of potential cross-laboratory research. Although laboratories define a comfortable and friendly unit to live in, they tend to isolate researchers, especially the young ones, who cannot enjoy the inspiring cross-fertilization that a more open and flexible structure would ensure. More senior researchers have other ways to be exposed to new ideas and stimuli, but the young ones live in rather isolated islands and lack opportunities to be exposed to unorthodox and novel ideas that may trigger radical innovations. Likewise, interaction and cooperation with other research groups in other Brno's academic institutions is rather limited. Systematic networking with other international research groups, in Europe and around the world, is also rather limited. There are notable exceptions, especially in the most active and visible groups mentioned above, but more should be done in most other areas.

Similarly, the geographic focus and ambitions seem to be rather narrow, with some exceptions, despite the fact that most research labs have the potential to compete internationally.

6. Overall Evaluation and Recommendations for Improvement and Development

The Faculty of Informatics has done a good job at identifying a number of areas where it can and should improve. Sometimes we felt that the faculty has not been as successful in trying to understand the obstacles that need to be removed and devising concrete and actionable plans to improve. We strongly suggest that faculty members prioritise improvement areas and empower individuals as responsible for improvement initiatives. For each improvement initiative, the faculty should (1) define precise and measurable goals, (2) identify best practices that may lead to improvements, (3) define a plan of actions, (4) monitor the effect, and (5) replan if necessary. Regarding (2), we suggest first look at local success cases and try to generalise. As mentioned, the faculty hosts very successful areas. Looking at what made them successful and trying to replicate creatively can be a first step. Looking at what other institutions have done, both nationally and internationally, is another step. We recommend seeking additional support by the university, as some of these improvements can only be achieved with structural and financial support of the MUNI.

Let us first focus on a number of structural problems which introduce considerable friction and obstacles into the faculty's daily life:

- The education departments are of very different sizes, and one can wonder about the usefulness of the 4 departments, and even of the organisation in departments.
- The organisation of research in 22 small units is an obstacle to the local, national and especially international visibility and interactions: we strongly advise considering the opportunities to merge labs in larger units, where current labs could become teams.
- There is a strong need and a pressing demand for better communications and interactions, both vertically and horizontally, as substantiated by further comments below.
- There are several academic institutions in the Brno area, and one can wonder if, at least at the research level, some new, larger units could be formed by bringing together people from MUNI's FI and from the Brno University of Technology.
- The name, role, position of the Institute of Computer Science with respect to FI are not clear. This is a very serious source of misunderstandings, which in particular negatively impact the younger researchers and PhD students.
- The management of the FI, departments and research units should be reconsidered and require action, to avoid institutional sclerosis, by for example limiting duration for the role of head of the various entities and by institutionalising councils with elected people of the different categories.

Regarding research, FI's main strategy should consist of maintaining excellence in areas where FI is already strong and investing in raising the international-level quality and visibility in areas deemed crucial for its future. As mentioned, FI is positioned extremely well in algorithms, theory, and cyber-security, but needs to strengthen in other areas, such as AI, big data, and (socio-technical) systems.

Hereafter we address additional problems and areas of concern, together with recommendations for improvement:

- **Visibility and attractiveness:**
    - By improving visibility at national and international level, FI can attract more talents. As mentioned, international visibility is currently very high in some areas and relatively low in others. FI should try to improve visibility at all levels to make it an attractive place to be in. Remember that although individual talented researchers are a strong attraction force, attractiveness of the global environment is also key. FI needs to rely both on its stars and on a vibrant cultural environment.
    - Related to this, FI seems to mostly favour inbreeding. Of course, being able to get input from your own best students is important. But not providing the same level of openness to external talents is bad. FI should try to identify a target of potential incoming new talents and define an improvement initiative.
    - In presenting FI to the outside world, for example through the website or other social media, research contributions should be very well visible and communicated effectively. The effort to group the labs in broader research topics is commendable, but perhaps needs to lead to re-thinking about some topics and how they are presented. For example, AI has become increasingly attractive and strategic. It has been presented, however, mostly as a set of applications, rather than as a set of core methods of broad applicability and impact. It is also unclear why certain specific application domains (like the medical domain) have been chosen. Likewise, the cohesion of themes under "SW/HW systems and services" is rather unclear, and at the same time it is

unclear whether the faculty is engaged at all in systems research. On a similar vein, the topic "Bioinformatics and system biology", which produced excellent results in theory, hints at a broad scope which seems to go beyond the current stage of cooperation of the faculty of Informatics with the department of Biology of the faculty of Science (pursuing more effective cooperation might be part of future directions, although we haven't heard on this).

- ○ FI should consider the use of social media as part of its communication and visibility strategy. Social media are widely accepted and used, especially by young researchers. Their use may boost FI's visibility.

- **Lack of participation and low competitiveness in international funding:** This goal should have high priority, because it is a precondition for improvement in many other areas (visibility, reduction of current duration of PhD studies …). Following similar initiatives in other European institutions, FI may consider creating an "office" to support researchers, also with the aid of scientists who have been successful in European projects, who can share their experience and help their colleagues in preparing proposals. This may work both for classical European cooperative projects and ERC proposals.

- **Diversity, inclusion, and gender issues:**
  - ○ FI is aware of the current imbalance with respect to diversity and gender, but during the review we haven't seen actionable plans. We noticed that FI's female PhD students are not even aware that the faculty considers gender and diversity a concern area. We recommend putting gender and diversity initiatives at the centre of faculty-wide efforts and broaden participation by including PhD' and young researchers. We also recommend looking at best practices in Europe and linking to current initiatives (for example by Informatics Europe).
  - ○ FI should define and implement effective mechanisms for reporting cases when individuals need to report about mistreatment. We heard about ombuds(wo)man, but we could not understand what are the necessary underlying processes and necessary privacy guarantees. Also, we understood that the current ombuds(wo)man is a faculty member. This might discourage people in need from contacting her/him. For this reason, in other institutions this role is taken by someone who is external to the faculty.

- **Teaching vs research:**
  - ○ Teaching and research are two complementary facets of academic life. However, we are concerned about the massive teaching load, which seems especially detrimental to young professors. FI should reconsider its current teaching distribution rules, according to which full professors teach much less than their younger colleagues, and the load in the different groups/departments/labs. This could support and encourage the young researchers in building their research lines.
  - ○ FI should seriously assess the current teaching load and its effectiveness. We have heard figures regarding the number of courses offered (400?) which is very worrying. Offering too many courses leads to more students to employ as helpers, which in turn leads to PhD students staying too long in the PhD program, which is another problem you have (see below). Could FI reduce the teaching load by rationalising curricula without affecting the quality of education? Can online courses be used to rethink/restructure the offer? Can FI team up with other academic institutions in the Brno area?
  - ○ Young professors raised their concern that teaching is not properly taken into consideration when it comes to promotion. A possible way to recognize

excellent teaching and teaching innovation is through teaching awards, which could be properly taken into account in promotion cases.

- **Internal organisation and processes:**
  - ○ **The current laboratory-based structure should be carefully reconsidered for changes and/or improvements. Most research labs have a small size and cannot gain critical mass in effort and hence nationally and internationally. Moreover, the rigid boundaries delimiting labs can prevent communication across labs and with other universities. FI should try at least to add initiatives that cross the laboratory boundaries, such as faculty-wide seminar series, open days for research, etc. FI should consider that young faculties and PhD students clearly and eloquently expressed the need for a more open cultural life.**
  - ○ **FI should institutionalise cooperative relations and communication channels between young professors (including post-docs) and PhD students and senior professors. We recommend involving people at all levels in decisions and issues that concern the faculty. For junior FI members the review has been a positive surprise because they could understand more about the place where they work. FI should do more of this!**
  - ○ **FI should formalise and publicise what is expected from young researchers to make successful progress and be recognized. PhD students and young professors raised the issue that both the required process is largely unknown or unclear, and also the mentoring that helps them make progress is weak or even absent. Since the reports provided to us refer to initiatives which aim at tackling these issues, the feeling that the problems still exist may be due to the lack of open communication we have already discussed. For example, despite your efforts, PhD students still ask for more significant feedback on their progress than they currently receive.**
  - ○ **FI should institutionalise the role of PostDocs. PostDocs are becoming key players within research institutions, but they are almost everywhere treated in an ad-hoc manner. What does FI expect from them? What should they expect from FI?**
- **PhD studies: More comments on this topic will appear later in this document. We wish here to anticipate and stress our concern about the too long duration of PhD studies. This should be a high-priority improvement area in which FI needs to engage. FI first needs to understand exactly which are the reasons that lead to getting a PhD in 5 to 6 years, which is not good. Too much time spent in teaching is perhaps a source. And perhaps it all boils down to the fact that not all supervisors can offer the necessary financial support, due to their inadequate funding level (especially, international funding!) FI should explore the feasibility of opening new PhD positions only when a supervisor commits to allocating enough extra funding for the candidate. Ensuring fairness of the distribution of FI funding for PhD students to the labs needs to be ensured too.**

7. Evaluations of the Laboratories CBIA, DIMEA, DISA, NLP

CBIA

The Centre of Biomedical Image Analysis (CBIA) is a small research unit, created in 1990 by Michal Kozubek, who is still the head of the unit. The team consists of 1 full professor, 4 associate professors and a few other people with different status (but not academic).

The research in the unit is focused on biomedical imaging, especially microscopic imaging for spatio-temporal cell analysis and tracking. Even if we have not visited the lab, its equipment seems excellent, especially in microscopy.

The lab is well recognized at the national level and also at the European level:

- since 2016, CBIA is a part of the national research infrastructure for biological and medical imaging,
- CBIA is involved in European research infrastructure project like ESFRI EuroBioImaging,
- CBIA is also involved in the COST action "Network of European Bioimage analysis" (NEUBIAS).

In the CBIA web pages, one can notice a large set of free access software packages developed in the lab: 5 for education purposes, and 6 for research purposes.

The publication list demonstrates a regular activity in the best international conferences and journals focused on biomedical imaging, but I believe that publications - especially in journals - could be enhanced.

In the web pages, in the documents and in the slides presented during the evaluation, one can regret that there is not a clear and large paragraph about the research perspectives of the team. In fact, during the discussion, it was clear that methods based on machine learning (ML) are at the core of current and future projects. One can appreciate that these studies are not limited to run ML software, but are considering fundamental issues like explainability. These studies are done in strong cooperation with another lab: RationIA. One can wonder if a larger lab with two teams (one on Explainable AI, one on biomedical imaging) could not be created for fostering the research and the visibility of these current labs.

The head of the lab, Prof. Michal Kozubek, has a very good international recognition on this topic, which appears especially through membership of international competition committees, like ISBI and MICCAI. The other academic members of the team spent some time abroad in recognized research centres (in France, Germany, Spain): this appears mainly through co-authorships in publications, but is not evident from other initiatives (e.g., shared research projects, shared PhD curricula, co-organization of conferences and summer schools). We noticed that the 4 associate professors of the team did their PhD under the supervision of Prof. Kozubek, and it seems that they are in the shadow of Prof. Kozubek. We would recommend encouraging them to become more independent within the team.

Summary of recommendations.

- **Enhance international relationships: It is not clear if the international relationships are used for exchanges or visits of scientists, and especially of PhD. These relationships could be used for short visits (which are mandatory during the PhD) or even for proposing PhD in co-supervision with dual-diploma.**
- **Enhance publications in international journals.**

- To increase the visibility of the lab, two actions could be valuable: (1) enlarge the lab by merging with another team, e.g., RationAI, (2) Michal Kozurek must push and help the other academic members to take international responsibilities.
- Finally, I recommend to publish much more accurate PhD proposals (see for instance in the Web pages: https://www.fi.muni.cz/studies/doctoral/calls/index.html.en), with at least one or two pages for the description, including the main objectives, some directions of research and international references. This will be beneficial for PhD students who will be more rapidly operational, and shorter PhD durations.

DIMEA

The Laboratory of Discrete Methods and Algorithms (DIMEA), Co-headed by Petr Hliněný and Daniel Kráľ, has its research focus on areas in the intersection of Theoretical Computer Science and Discrete Mathematics. With only two professors, it is a very small laboratory. The two professors both have an excellent research record, and are well recognized and well connected in the worldwide community of Theoretical Computer Science. This is documented, among others, by an ERC Grant and the Fellowship of the AMS, Editor-in-Chief of SIAM Journal on Discrete Mathematics, best paper awards on worldwide leading conferences, and further active engagement in services for the research community.

The Lab offers a lively, stimulating research environment for Postdocs and PhD students. Besides the joint seminar with Formela, it is involved in ALGOMANET, a cooperation of strong (and typically much larger) research groups in Theoretical Computer Science in Poland, Czech Republic, and Hungary. ALGOMANET offers one- or two-week PhD courses. In addition, the Lab offers discussion and presentation formats like the DIMEA Days, which also contribute to fostering cooperation and communication especially among PhD students.

Funding of the Lab leaves room for improvement (similar to the whole faculty). Besides the ERC grant, there is some local funding. But the group with its high research potential could become more active in becoming involved in European projects. Similarly, the very successful community-building shown in ALGOMANET could be extended further within Europe. DIMEA could certainly be an important member of consortia like IGAFIT, to the benefit of both sides. A further area for improvement is the role of DIMEA in the Faculty. There are many Labs that could benefit from the algorithmic expertise available in DIMEA. Although there seem to be some connections, an organisational framework could form a basis for strengthening such efforts.

It is clear to us that realising the mentioned ideas for improvements puts additional burden on the two full-time members of the Lab. Therefore, and because of the scientific excellence of the Lab, we recommend extending it by at least one permanent professor position.

DISA

The Laboratory of Data Intensive Systems and Applications (DISA) carries out research on techniques for similarity-based indexing and searching in complex unstructured digital data (with main focus on images and video of human motion).

Prof. P. Zezula is head of the DISA Lab and there are 5 more lab members on staff, 2 of which are post docs. There are a few PhD students in the lab.

We could identify two strands of fundamental research depending on the digital data used, namely a) research on similarity in images for the purpose of scalable image retrieval and b)

research on new approaches to represent human motion and the related content-based processing research. The main research output of the former area revolves around the so-called MESSIF (Metric Similarity Search Implementation Framework). Both strands of research have also been evaluated through application in multiple application domains documented in the self-evaluation report, the presentation given at the on-site evaluation and the research projects the lab is participating in.

It is evident that the group has a much focused agenda on similarity research and activities and we enjoyed the enthusiasm with which the research topic has been presented and is being addressed by the members of the DISA lab.

We could observe a slight unbalance in the ranks of members of the group, as well as in the h-index metric and citations count, which might be related to the high workload, small size of the lab and hence the lack of critical mass to improve visibility and amount of research output.

From the SWOT analysis of the lab we could identify several areas that require more attention and improvement:

- The lab's activities are not sufficiently supported by the current faculty structure with regards to funding continuation of skilled PhD students. In many cases, due to missing follow up funding, PhD students have to leave the lab as there is no structural support from the FI to account for lack of additional, third-party funding.
- The size of the group is small and limits research activities, research output and visibility of the group. Increasing the number of PhD students is highly recommended.
- Due to the uncertainty of industry funding looking into more national and international grants applications would be advisable.
- Communication between the DISA lab and the management of the FI should be improved to ensure a sustainable future of the lab.
- High teaching load of the group members requires special attention by the FI.

Regarding the overall research vision of the DISA lab we observe a very close focus to the topic of similarity research that is evolving around information retrieval issues connected to images and videos mainly. There are other fields of data intensive systems and their applications that the group might want to explore.

NLP

The NLP core forms part of the AI activities with two main activities: computational lexicography and the development of tools for biomedical applications. The lexicographic outputs are in the Czech language, enjoying international reputation. The development of tools (parsers, morphological analysers, etc.) have both an educational role (lexicographical tools) and are geared towards main NLP downstream tasks (Machine Translation).

We recommend that the research of the NLP theme, given the enormous interest in language technology, could be extended in other areas, such as information extraction, summarisation, question-answering, etc. Links with European networks such as ELLIS https://ellis.eu/ and META-NET http://www.meta-net.eu/ are encouraged as an extension to the existing links with CLARIN. Members of the AI group and NLP could apply to become members of ELLIS and benefit from opportunities of joint studentships, workshops and other research activities.

These links will also allow cross-fertilisation across related areas (machine learning, deep learning and NLP). The group has international industrial and research links and more are encouraged using the appropriate channels. Interdisciplinary links can be encouraged given

the need of NLP tools in many applications (law, medicine, engineering). Joint PhD programs (inter-Faculty) will support interdisciplinarity and translational research. Attracting more PhD students will be supported by joint degrees and interdisciplinary offerings.

Translational research will be beneficial for funding possibilities across Europe, ERC grants, H2020 but also international collaboration with countries outside Europe (UK, USA, Canada, China, etc.).

The NLP laboratory during their presentation, placed more emphasis on the development of tools; although this aspect is crucial for industrial applications and the language technology in Europe in general, we recommend the research underpinning the development of these tools is also highlighted.

II. Doctoral Studies

1. General Evaluation of Doctoral Studies

Doctoral studies aim at forming the new generations of scholars which sustain an institution's contribution to advancing science on the global scene. Doctoral studies are an essential aspect of an academic institution. We have already commented on several issues and given recommendations related to doctoral studies as part of MUNI SI's research. It is in fact hard, if not impossible, to take doctoral studies apart from the school's research efforts and strategy. Here we wish to stress once again that FI should strengthen its efforts to recruiting incoming PhD's outside MUNI, both nationally and internationally; it should provide effective financial support; it should provide better ways of monitoring their progress and reduce the duration of their study; it should provide a broader and more stimulating cultural environment that opens to cross-area interactions. It should be clear that when FI is admitting a student in the PhD program, it is not simply a decision to hire someone to work within the predefined boundaries of a specific project, but instead FI commits to nurturing a young researcher to become a responsible, independent scientist.

2. Evaluation of Specific Doctoral Degree Programmes

2.1. Degree Programme Identification

Name	Computer Science
Form	Full-time, combined
Language	Czech, English

Faculty	Faculty of Informatics

2.2. Graduate Profile and Study Goals

Each PhD student develops his/her research work in a specific laboratory without structural contacts with students and researchers from other laboratories. This may introduce significant differences in the research experience of different students. Based on the discussion the committee had with young faculties and PhD students, we have noticed that the interpretation and implementation of the study program goals are different in the different labs. This makes it difficult to evaluate how supportive the study programme is of the research strategy of each individual student.

2.3. Admission

The selection criteria are not well known to the PhD candidates. Moreover, the PhD project descriptions available on the web page are too short and not informative enough. Essentially, they describe a research area without any attempt to define a research plan that could be used by candidates to get an idea of the required type of work, goals, etc.

Candidates must submit, as part of their application, a written acceptance agreement by their future supervisor. This implies that they must know a priori the faculty members and be able to approach and interact with them. While this is certainly possible for candidates coming from the internal study programme, it may be very difficult for other students, especially foreigners. A two steps admission process where the candidate is first evaluated for his/her CV and, only after passing this first step, associated to a supervisor could be beneficial.

In general, the selection procedure does not hamper international candidates to apply. However, the need to know the potential advisor a-priori together with the limited salary reduces the attractiveness of the doctoral school.

Another aspect that has emerged during the discussion with PhD students concerns the fact that the actual salary assigned to each PhD position is not predictable at the beginning as it depends on the willingness and ability of supervisors to acquire extra-funds to complement the basic salary. This does not allow candidates to concretely plan for their future as students.

2.4. Course of Studies and Student Research

Not all topics of doctoral theses follow up on the grant activities run by the faculty. As far as we could understand, some activities are not directly supported by research grants and this implies that students must complement their basic salary either by investing a significant amount of time on teaching or by finding an external job

Doctoral students appear to be heavily involved in the research of the laboratories they belong to. We noticed, however, that students working at the Computer Science Centre were feeling detached from the faculties, its departments and its labs.

The faculty has set specific targets for research outputs and is developing actions to encourage students to fulfil these targets. We see this as beneficial to guide students through the accomplishment of their target. However, we also recognize the fact that the number of papers that can be considered acceptable for a PhD dissertation depends on the research topics and on the adopted research methodology. Other indicators could be relevant in specific cases. In the report, the availability and impact of open source products has been mentioned. Others could be considered as well and should be identified case by case.

A system providing feedback to doctoral students is in place. The problem is that the feedback is explicitly given only when negative. Positive feedback and suggestions for improvement are not provided by the doctoral school. This is perceived by PhD students as an issue. Another point that was specifically raised by doctoral students is that sometimes the process leading to identification of a precise topic for their thesis and scoping of their research takes too long. We would recommend the faculty to pay particular attention to this last issue and to exploit the periodical evaluation as an opportunity of discussion between the committee and each individual student outside the boundaries of the specific lab.

A system providing feedback to supervisors is embedded in the annual evaluation of faculties. This process does not seem to be structured to take the opinion of PhD students into consideration. It only includes feedback by senior faculties and the structure of such feedback does not seem to be clearly defined.

2.5.   Internationalisation and Personnel Strategy

The programme is attended by some foreign students and they are supported by their lab mates as well as by the administration.

It is not clear how easy it is for foreigners to get in touch with individual faculties and receive from them the agreement letter mandatory for submitting the application to the PhD studies.

Even if double degree programmes are possible, the committee was not informed about the institution of specific ones related to the computer science PhD programme. Their institution could be a valuable tool to increase internationalisation and collaboration with other research groups.

The number of approved supervisors (49) is adequate to the number of students (97).

We see, however, an excessive dependency of the whole PhD programme on the direct relationship between each student and his/her supervisor. While this relationship is clearly an important part of research-oriented studies, still the faculty should set up more transparent processes and organisational structures to help identify and cope with any issue in the student-supervisor relationship.

2.6.   SWOT Analysis and Development Suggestions

The SWOT analysis is generally very good and clearly identifies strengths and weaknesses.

Among the internal strengths, we could not find clear evidence of the "good relations and cooperation between different research groups at FI". More specifically, while some cases of good collaboration are in place, we could not see structural mechanisms to ensure such cooperation. At the same time, the discussion with the students has highlighted the fact that each laboratory appears to them as disconnected from the others.

2.7.   Recommendations for Future Development of the Degree Programme

The doctoral program is clearly taking advantage of the very good to excellent quality of the FI faculties. The points for improvement mainly concern a substantial reduction of the PhD duration (this point has been already highlighted in the overall evaluation and recommendations for improvement and development section) and the creation of structural mechanisms to ensure that the same very high quality level is kept in the support offered to all students working in all laboratories. As mentioned above, we would suggest to focus on the following points:

- Improve the recruitment mechanisms to be more open toward external students. This concerns a clear definition of acceptance criteria, an evaluation of the candidate decoupled from the acquisition of the agreement letter by an internal faculty, and a clearer and more precise definition of the research proposals published by faculties.
- Align the salaries of students and reduce the need to compensate the low salary with other activities that inevitably divert the attention from research.
- Improve the evaluation mechanisms by also offering positive feedback and helping the students correct their path. In particular, make sure that during their first year students develop a credible research plan that may successfully lead to their thesis. This is a key part of the mentoring process offered to PhD students.
- Create a neutral structure to deal with any issue arising between PhD student and supervisor.
- Allow PhD students to participate more actively in the Faculty organisation. Allowing student representatives to participate in councils and committees could help in increasing such active participation.
- Limit the usage of purely numerical parameters based on the number of published papers to assess the maturity of a dissertation and include also other parameters and considerations.
- Continue strengthening the actions aiming at reducing the duration of the PhD studies setting an average of four years as the target.
- Create opportunities for collaboration and exchange of ideas among students and researchers from multiple groups/labs.
- Promote the creation of double degree programmes to improve internationalisation and exchange of students and faculties.