

# Report from the advisory board

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## 1 Analysis of LIACC

On February 10 we visited LIACC and listened to a series of presentations in the morning showing the achievements of the institute. In the afternoon a number of demonstrations were given and a closed meeting with the PhD students was hold.

Overall we had a very positive impression of the activities of the institute. In recent years LIACC has gone through a number of restructuring processes with groups leaving and joining. The current structure, based on a group on distributed artificial intelligence and a group on formal methods seems stable and with perspectives to continue like this.

The research activities are many and very varied. The activities are more focused than in our previous visit. For most of them the research is at the forefront of the corresponding field. This gives the possibility to establish new international connections and to strengthen those already existing. These connections should be used to increase the European projection of LIACC in the form of new international and bilateral research projects.

The PhD production is very good, with motivated and well educated students. The involvement in Master programs is also very good and leads to results well connected to up to date research topics.

We acknowledge that the LIACC has followed previous recommendations of this evaluation panel and has made a SWOT analysis of its activities.

## 2 Analysis of Distributed Artificial Intelligence and Robotics DAI&R

### 2.1 Summary of the team

This research group concentrates its activities around the concept of interoperability and in the development of practical applications, demonstrators and proof-of-concept developments. It shows a very high activity in publishing in the relevant conferences and workshops of the area. Its international visibility is high, and in some subareas (v.g. “electronic” institutions and virtual organisations) it is the reference group in Portugal.

## **2.2 Scientific evaluation**

The results of the group are many and cover a large list of topics in the field of agents and multiagent systems. The group shows a good balance between theory and development

The group publications have important impact, specially in the area of digital models of institutions, including B2B trust and reputation.

The relation with the other group of LIACC could be increased specially on the formal aspects of language definition.

## **2.3 Technology transfer**

The group is very competent in software development and has produced a large number of prototypes and an impressive amount of joint work with companies. Overall, this is a strong asset of the group.

We encourage the group to create spin-offs due to the large amount of practical applications developed. Students should be encouraged to try and start up companies along the lines and results obtained in the group.

## **2.4 Conclusion**

Overall the research group is doing well and the papers and tools are of high quality. The group has followed previous recommendations in order to increase the number of publications in journals and now the number and quality of them show a good direction. Higher participation in EU projects should be obtained.

# **3 Analysis of Computer Science Group**

## **3.1 Summary of the team**

Activities are conducted in the following areas:

- Declarative information systems,
- Complexity,
- Formal aspects of computation,
- Formal verification and type checking,
- Security and safety.

It shows very good activities in all these areas in terms of publications and tools.

### **3.2 Scientific evaluation**

During the last years, the group has obtained useful and original results in complexity and formal aspects like type-checking and theorem proving. The promising technique of Proof Carrying Code has received a push. Although most of the research is theoretical several practical developments have been obtained. The results obtained about linear calculi have been well received by the international community.

With publications in very good conferences the team has a quite good academic activity, visibility and production. We recommend continuing to increase the presence in main journals of the field.

### **3.3 Technology transfer**

Several research activities of the team have potential for technological transfer. Security, optimisation as well as data bases. The group is encouraged to be attentive to transfer opportunities, shall these concern industrial as well as societal transfer.

### **3.4 Conclusion**

The CS team is having very good results in areas that are getting wider. We encourage to continue in this way and give a bigger push to PhD production, technology transfer and participation to EU projects.

## **4 General recommendations**

We acknowledge that LIACC performed a SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) as recommended. We are very satisfied with the presentations and the effort made by the co-ordination board to give a clear evidence of the impact measures of the work done, as we also recommended. Overall we think LIACC made a serious effort to follow our previous recommendations.

We have the following general recommendations:

- In order to allow for better analysis, both internal and external, we encourage the two teams to make an annual activity report, and to make it available on the web every January.
- We suggest to the co-ordination board to write a short document that describes the strategic plans of LIACC for the next 4 years. This should describe both the scientific areas that are going to be covered as well as the general organization deployed to achieve these goals;
- We strongly recommend the organization of a lab seminar, that all lab members should be encouraged to actively attend;
- There should be an annual “general assembly” of lab members to present and share results, objectives and strategy.

- Clear strategies should be deployed to better understand the PhD need. See later in this document.
- An analysis of the relationship with other labs in computer science in Portugal would be valuable. We appreciate as an important asset of LIACC the fact that several permanent people of the lab have indeed their professorship positions in universities “far” from Porto. This is an interesting and useful situation that seems to allow for the focalization of several professors on common research topics in a main place like LIACC. We suggest to make this relationship formal and more visible, so as to see LIACC as a scientific hub of the region.
- In term of cooperation, we suggest to increase the international presence by a more aggressive policy with EU projects in particular with the FET program.
- LIACC should improve the internal organization to better serve the researchers and to help protecting the generated knowledge (e.g. engineers to maintain the results or valorisation managers to improve the relationship with industrial partners)
- LIACC should advance in an strategy to impact into industry.
- LIACC research is divided into separate lines, the LIACC should benefit from a more integrated view of research. In particular by defining one or several use cases that might be interesting for several groups. E.g. railway security could be useful for simulation, verification, trust and text mining (e.g. treats, opinions).

## 5 Situation of the doctoral students

During a private meeting with the students we had the opportunity to question them and listen to their views on the functioning of the institute. Overall the students show passion on their activities and are happy and proud of being members of LIACC. A number of potential improvements of the LIACC procedures were discussed. We recommend the co-ordination board to spend time discussing them as they are very valuable suggestions.

**Referent.** Students feel that there is a need for coaching beyond the PhD advisor. Explaining the procedures of LIACC, helping them through their PhD process, counselling in their decisions, and overall planning their scientific career.

**Post-doc.** There should be a more institutional policy concerning post-doctoral studies. A year before the end of the PhD students would like to have a mechanism to discuss the prospects of postdoctoral studies. For instance, helping students to look for funding or to make contacts with potential hosting labs. In this respect, the board should consider whether there is the possibility of offering short-time contracts (up to 6 months, for instance) to help bridging the end of the PhD and the start of a post-doc.

**Industry.** LIACC should develop a strategy to build up stronger links with industrial partners. In particular, it would be important to devise mechanisms to define realistic use cases that might help PhD students in their activity. Also,

explore the possibility that companies co-fund the salary of PhD students so that the student has on the one hand access to data and use cases and on the other opening the possibility of future jobs within the company.

**Startups.** More than 50% of the students in the room (9 out of 17) have the intention to create their own company at the end of their doctoral studies. This is a very positive asset that the co-ordination board has to analyse in detail. In particular, students would like to receive support from LIACC in the preparation of their spin-offs. For instance, by mediating with the University of Porto in order to use spaces for the companies or by supporting in the generation of first contact with possible customers that might boost the creation of the companies.

**Integration.** Students would like to have a more integrative view of their activities. There should be some group activities that facilitate the internal exchange of ideas among the PhD students community.

**Structure.** Students don't have the perception of a structure within LIACC. The co-ordination board should make an effort to explain the procedures to students and also try and refine the internal structure to answer the students suggestions as well as some of the recommendations included in this report.

**Europe.** Students would like LIACC to be more involved in EU activities: projects, networks, etc. This view concurs with the recommendation of this report.

We found the students were enthusiastic, entrepreneurs and with a lot of energy. This is an important asset of LIACC.

## 6 Conclusion

We consider that LIACC is an important research lab with a very good international projection in its research activities and that it has a brilliant future perspective. Following the above recommendations, we encourage its members to increase the cohesion of their activities and to continue their plans for a common project of future.