Editorial

Dear Reader,

At the end of these past five years of MoVES as an instance of Phase VI of the Belgian Federal IAP programme, it is proper to consider past, present and future of the consortium.

When the different partners assembled for the first time six years ago to consider submitting a project proposal, there were quite a few more questions than certainties about the mission of MoVES. But the consortium started with a unique pool of researchers specialised in advanced software engineering. It brought together 8 research teams from Belgian universities and in a supporting role teams from France and the Netherlands. These teams varied in size, age and research objectives; some deserved the status “emerging” while some had been in existence for 20 years. Prior contacts were informal at best and only in selected cases had led to tangible collaborations. Despite this fact, we can today safely state that MoVES has been an unqualified success: it resulted in bringing research groups from all over the country together in the exact sense that the IAP programme pursues.

Because there lies the true power of the MoVES consortium: bringing together multiple teams that previously had limited contact and produce a multiplier effect that was unattainable in the absence of MoVES. Possibilities were legion: shared participation in and organisation of conferences, workshops, summer schools; shared PhD programme events; shared dissemination of results using paper and digital media; branding MoVES at an international level. But at the core of the consortium lay a desire to collaborate in shared research, to be brought out using well-known research channels but first and foremost in co-directed PhD degrees.

These considerations have caused the consortium to submit a MoVES II proposal for the recent call issued by BELSPO for a Phase VII IAP project. Most of what follows was inspired by that document - it matches the “as is” of MoVES: what we learned in the past five years, with a “to be”: the guidelines for future collaboration.

MoVES is essentially about raising confidence in the process of developing and maintaining software: MoVES intends improving sustainability of software artefacts. The MoVES consortium supports software development by providing models that impart behaviour to a software artefact; by verifying that upon translation into an operational form this behaviour produces expected results; and that this operational entity can be made to evolve in synchrony with the original model.

The MoVES consortium, despite its size, can only contribute to isolated segments of what amounts to a massive research domain. Hence there is a strong tendency to favour research topics in software engineering where the MoVES partners possess proven and internationally recognised expertise and can effectively make a difference. This signifies more than a focus on the strong points exhibited by the partners’ research; MoVES proposes to investigate 6 distinct research themes where it is estimated that true added value can be generated by pooling the effort of two or more sets of complementary research expertise. These themes have been determined to be: multi-paradigm modelling, advanced modularity, concurrency in the large, quantitative assessment of software, dynamic adaptability and collaborative software development.

Software has never before played as significant a role in society as it does today; and there is every indication that this role will only increase in importance. However, software artefacts are of a size and complexity to rival any engineering construct in the physical world; but they are even more of a challenge to human ingenuity than most mechanical, electrical or chemical engineering tasks. Also, the physical platforms used to execute software continuously expand in every dimension, except in controllability by their human operators.

MoVES applies five different scaling aspects to software development. They are used as a yardstick to measure sustainability of software artefacts, and hence confidence in them. These are: the degree to which mathematics can offer guarantees; the breakneck speed at which technology evolves; the technical/scientific innovation in software languages; the lifetime of software and its ageing characteristics; and last but not least the collaborative nature of software development.

(Continued on next page.)
We already pointed to sustainability as a major objective of MoVES. Traditionally this has economic significance, and in a real-world context mainly socio-economic measures impact on sustainability. In a software context, sustainability has a similar meaning, i.e. extending lifetime and maximizing reusability without loss of quality, however, measures to improve software sustainability are of a unique nature. They require fundamental contributions from the research community using, but not necessarily limited to, the five yardstick scales mentioned before.

It is obvious that although part of the proposed MoVES research agenda touches upon real and immediate problems, part of it is of a more academic nature. This implies that results might take some time to be validated in a real-world context. But it is the intimate conviction of the partners that MoVES stands or falls with all of its proposed constituent activities. MoVES addresses fundamental research issues that challenge human ingenuity comparable to many research domains outside computer science. It should not be forgotten however, that in addition to the academic objectives of the MoVES consortium, it helps respond to an extremely crucial, immediate and constantly growing need of society for truly reliable software.

Enjoy reading!

Theo D’Hondt

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Andreas Classen

Promising Young Researcher 2009 Award Winner: Andreas Classen

The research conducted for my PhD thesis investigates an approach for model checking in the context of product lines, where each product is specified in terms of its features. Most of this work was conducted within the MoVES project (esp. work packages 5-7), in collaboration with Jean-François Rasquin from ULB and Axel Legay from Inria Rennes/ULg. One of the benefits of a research network such as MoVES is the ability to bring together a large number of experts on a certain topic. To a young researcher, this was of great help, not only to meet people, but also to gather ideas, pointers to relevant literature, and opinions. Moreover, the funding for research visits within the network made it possible to focus on doing research, rather than finding funding to attend scientific meetings and conferences.

The research I did as part of the project led to several joint publications, including two papers at the International Conference on Software Engineering (ICSE) in 2010 and 2011. I received the MoVES award in 2009, which contributed to my travel budget and enabled me to attend the ICSE conference in Cape Town, South Africa, in 2010. I have benefited greatly from being part of the MoVES network, and advise every young researcher to look for a similar environment to conduct his research in.

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Arnaud Hubaux

Promising Young Researcher 2010 Award Winner: Arnaud Hubaux

The MoVES project has been a cradle for the new-born researcher I was. The three work packages that took me on board (WP2, 3, and 4) taught me to think, act, and communicate as a researcher. My research in MoVES focused on the development of a formal foundation to collaborative feature-based configuration as well as tools to support the verification and execution of complex configuration processes. The collaboration with partners from the KUL, UA, UCL, and VUB resulted in four joint publications, one of which in the journal of Software and Systems Modeling (SoSyM).

The expertise gained in MoVES also gave me the opportunity to be a visiting researcher at the GSD Lab of the University of Waterloo (Canada) under the supervision of Prof. Krzysztof Czarnecki. For one year, I worked with his team on conflict detection and resolution in software configuration, which lead to a submission to the International Conference on Software Engineering (ICSE ’12). The MoVES reward contributed to the travel budget of my stay.

The MoVES award acknowledges the accomplishment of four years of intense work. It is an honour I am immensely grateful for. But, as William Faulkner said, “This award is only mine in trust”. With a PhD now at my fingertips, I step down and leave the stage to more talented young researchers.

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ASE 2010, the 25th IEEE/ACM International Conference on Automated Software Engineering, has been organised in Antwerp from 20 to 24 September 2010. The ASE conference brings together researchers and practitioners from academia and industry to discuss foundations, techniques and tools for automating the analysis, design, implementation, testing, and maintenance of large software systems. Since its inception as a US project meeting 1986, ASE has come a long way to become one of the world’s premier conferences in software engineering.

The program featured 33 full paper presentations and 26 posters, selected from 190 submissions, as well as 18 tool demonstrations and a one-day Doctoral Symposium, where junior researchers can present their work and receive feedback on their research and guidance on future directions from a broad group of advisors. The program also proposed eight associated workshops and five tutorials. The conference attracted a total of 250 participants from all five continents, with 25 from Belgium alone. The 25th anniversary was the occasion of special celebrations and memorabilia.

The bid for organising ASE 2010 in Antwerp was proposed and headed by Prof. Charles Pecheur (UCL) on behalf of the MoVES network. No less than ten out of the seventeen members of the organising committee were MoVES partners representing most participating institutions, notably Prof. Kim Mens (UCL) as Treasurer and Prof. Serge Demeyer (UA) as Local Organisation Chair. The conference was graciously hosted on UA premises.

The MoVES network was a decisive enabler for bringing such a major event in Belgium. The coordination of a major international conference is a demanding task that is best performed by a cohesive team, and MoVES brought in that cohesion. In return, the conference provided a privileged opportunity for the Belgian software engineering research community at large to meet with worldwide experts in the field. It also gave unprecedented international visibility to the MoVES brand name. As such, it constitutes one of the crowning moments of the first phase of this blossoming partnership.

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The 9th edition of the BElgian-NEtherlands software eVOLution seminar (BENEVOL 2010) has taken place in Lille, France, on December 16th, 2010. The aim of this seminar is to bring together researchers from Belgium, The Netherlands, and neighboring countries to identify and discuss important principles, problems, techniques, and results related to software evolution research and practice. The organisation of this day was funded by Inria (http://www.inria.fr/en/centre/lille), LIFL Laboratory (http://www.lifl.fr/) and University Lille 1 (http://www.univ-lille1.fr/).

50 people from 7 countries with 2 large delegations from Belgium (17) and France (19) attended the workshop. The program committee, co-chaired by Stéphane Ducasse (Inria), Laurence Duchien (University Lille 1) and Lionel Seinturier (University Lille 1), selected 18 papers out of 19 with 6 full papers, 10 short papers, 3 tool demonstrations (Be: 6, Fr: 6, Nl: 4, De: 3). Each paper received four reviews. The program was divided into four sessions and a keynote.

The keynote was about Humane assessment by Tudor Gîrba, netstyle.ch. The four sessions were about Model Evolution, Code Evolution, Software Co-Evolutions and Evolution in CBSE and Services Approaches. A call for a special issue of the Science Computer Programming journal has followed this workshop with Lionel Seinturier (University Lille 1) and Mark van den Brand (Eindhoven University of Technology) as guest editors. 28 papers were received. The selection process is still ongoing, but between 6 and 9 papers should be published in this special issue in the first half of 2012.

The previous day (December 15th, 2010), the RIMEL (Rétro-Ingénierie, Maintenance et Évolution des Logiciels - Reverse-Engineering, Software Maintenance and Evolution) French group of the CNRS Research Group GPL (Génie de la programmation et du Logiciel - http://gdep.gpl.cnrs.fr/) held its annual day in Lille and most of the participants took the opportunity to join the BENEVOL workshop.

Thanks to the MoVES Network, our teams had the opportunity to organise this BENEVOL Seminar. This day was the occasion of many scientific exchanges and a better understanding of the work in software engineering research community in North-West Europe.

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During the last years, I have been an active contributor to the MoVES network, first as PhD student at University of Namur (FUNDP), then as post-doctoral researcher at INRIA Lille. During my PhD thesis (2004-2009), my research work was dedicated to the understanding and evolution of large information systems. My contributions in this field consist of a set of analysis, transformational and generative techniques to automatically support the co-analysis and the co-evolution of databases and programs, in particular in the context of system migration. My thesis entitled “Program Analysis and Transformation for Data-Intensive System Evolution” received the IBM Belgium Award 2010, presented by the F.R.S./FNRS. Thanks to an ERCIM “Alain Bensoussan” Fellowship, I then spent one year as post-doctoral researcher at INRIA Lille (2009-2010), where I was a member of the ADAM team led by Prof. Laurence Duchien. While my PhD work mainly considered software evolution at design time with a focus on program transformation, the post-doctoral stay provided me with the opportunity to extend my expertise to dynamic software evolution with a focus on architecture adaptation. I contributed to such topics as dynamic software product lines, feature-based architecture composition, reverse-engineering architectural variability models, and context-aware/contract-based dynamic reconfiguration.

From a professional point of view, this one-year visit led to more than ten publications, including five joint papers with ADAM team members. It also marked the start of a research collaboration between the ADAM team and FUNDP’s PReCISE research centre, that is still continuing today. At the time of preparing this newsletter, Prof. Patrick Heymans (FUNDP) is working as visiting scientist in the ADAM team.

From a personal point of view, I learned a lot from this unforgettable experience, since I had the chance to meet nice people, work with great researchers, and make good friends.

In September 2011, I have been appointed assistant professor at FUNDP, where I am now building a new research team dedicated to software evolution. In the future, I would love to welcome a researcher coming from a partner institution to Namur, just as an excellent way to say thank you.

At the time of applying for a part-time position at the ULB, I had been a post-doctoral researcher for about one year at the VUB. During the MoVES kick-off meeting in March 2007, I was informed that there was an open vacancy at the ULB for teaching the course Software Engineering to first year students of Master in Computer Science. I have been combining this teaching assignment with my full-time post-doctoral position at the VUB for 4 years now. Before that, I had no idea what the computer science program implied, or what kind of research was done at the ULB Computer Science department, even though these people were only a footstep away from us. Although my assignment did not include a physical move, it meant a cultural move. For the first time, I was confronted with articulate students and the decision power of assistants and students. Sometimes differences are hidden in small details but knowing them helps!

Also the work performed by the different research groups of the ULB Computer Science department was completely new to me. Most of their research is oriented towards theoretical computer science. Nevertheless, I am currently involved in collaboration about the usage of Petri nets in software engineering. Although it has not yet resulted in any concrete research output, we hope it will soon do!

Thanks to the MoVES network I have met a lot of new people doing interesting research. Hopefully the network continues, because it is a very nice opportunity for young researchers to leave their cocoon and get in touch with interesting research domains elsewhere, in fact just next door!
Co-Tutelle in the MoVES Network: Véronica Uquillas Gómez

After doing a master programme at the VUB, I started a PhD at the Software Languages Lab. Despite being a foreign student from Ecuador, I was therefore already accustomed to the research environment of the lab, and was immediately introduced to the MoVES network. MoVES played a vital role in the identification of my research topic. Given my interests, my promotor – Prof. Theo D’Hondt – introduced me to Prof. Stéphane Ducasse, director of the RMoD Team at INRIA Lille/University of Lille 1. Together, we identified the topic I am currently working on, namely representing, characterising and understanding source code changes. In particular I focus on providing tool support for source code and history analysis.

While my research overlaps with the research interests of the Software Languages Lab, the main motivation to establish a co-tutelle was that the expertise of SOFT could be complemented by an external co-promotor. Despite the initial troubles setting up the administrative part of the co-tutelle, the research immediately benefited from ties with two partners of the MoVES consortium. In addition, both partner universities encourage students, even financially, to establish this kind of collaboration. The advantages of my co-tutelle are countless but I can summarise the most important ones as more research feedback, and access to a larger research network. Given the complementary nature of both research groups involved, input from both labs has greatly helped me to improve my work. Furthermore, I was able to quickly expand my research network by having access to the research partners. This has provided me more opportunities to perform case studies and acquire diverse users of my research artifacts.

This has been a fruitful collaboration resulting in three shared publications (amongst others at the WCRE conference, at the Smalltalks workshop, and in the Computer Languages, Systems and Structures journal). My research culminated in the Torch tool for characterising and understanding changes and in the Ring meta-model and infrastructure for source code and history analysis. While both artifacts started out as research prototypes, they are actively used by the Pharo Smalltalk community. In addition, the Ring meta-model will be released as part of the core of Pharo 1.4.

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Co-Tutelle in the MoVES Network: Sylvain Degrandsart

I'm currently doing a PhD in co-tutelle between a Flemish university (the AnSyMo team of University of Antwerp - UA) and a Walloon university (the Software Engineering Lab of University of Mons - UMons) under the respective supervision of professors Serge Demeyer and Tom Mens. If I ask my fellow PhD students what a co-tutelle is, they jokingly reply that it is a good way to cumulate the holidays from both sides. Of course, the cumulation is also applicable to all the administrative load that I would have preferred to do only once.

A co-tutelle, or any other type of long-term interuniversity research collaboration for that matter, is valuable for any PhD student, regardless of the stage he is in. In the case of my research, the phase of the research was an important period in the life of the researcher. Being a researcher in two different teams at the same time doubles the number of colleagues you can discuss with about readings and research questions you may have. In addition, the frequent switch from one research team to another requires a more strict adherence to research guidelines and principles, which is always beneficial for a researcher. It is necessary to synthesise and structure your research advances in order to keep both of your supervisors informed of your research progress in a reasonable amount of time.

From a more personal perspective, carrying out research in two different sites helps to keep an open mind, especially if there are linguistic and cultural differences in the research groups at each site. The co-tutelle also teaches a wide range of cross-cutting skills that are always very appreciated in an industrial environment: team work, knowledge agility, synthesising and presenting technical content quickly, etc. The co-tutelle also put me in a unique position to establish some tangible links between the groups. For example, the version repository of one of my colleagues in Mons was used by a student in Antwerp for an experiment on mining software repositories.

To conclude, even if the time required to travel from one research team to the other is quite long (in my case, Mons and Antwerp are 120km apart), I would not hesitate if I were to make a choice again on initiating a PhD in co-tutelle. Although it may look more like a burden than a blessing at first, it is really worth the effort, since there is a big return on investment for all the aforementioned reasons.

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Like all IAP projects, the MoVES network was peer-reviewed with a so-called “ex-post” evaluation. In preparation, the consortium compiled a report on the period 2007-2009, detailing the achievements of the network. This report was reviewed by four software engineering experts, and based on these reviews a second committee compared all projects in similar fields. The radar chart below shows how MoVES compares to other new networks in the category “Exact and Applied Sciences”. [The red line shows the average score for all projects in our category, the blue line represents the MoVES network.]

As can be seen our main strength is our ability to train PhD students and help young post-docs. The success stories in this newsletter (Promising Young Research Award on p. 2, post-doc mobility on p. 4, joint PhD degrees on p. 5) illustrate this strength quite well. A second strength is the visibility we achieved; the events organised during 2010 (ASE and BENEVOL see p. 3) serve as an example of these activities. Of course, there is room for improvement as well. First of all, we need to establish a research roadmap to intensify collaborations and establish a long-term vision on software engineering research in Belgium. Secondly, we need to set up a more agile project management structure that is capable of reacting to new opportunities and ensure that “the whole becomes more than the sum of the parts”. That is exactly what we did during the last year of the project and all of this materialised in a proposal for the coming round of IAP projects. The editorial on p. 1 gives a glimpse of what is yet to come.

Enjoy the last MoVES event and the associated BENEVOL event where this final newsletter will be distributed. These will also be the last official meetings of the network, but as the saying goes: “last is not least...”.

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