International Software Architecture PhD School (ISAPS)
23-26 April 2018 @ Oort

Science:
Our goal was to organize the second instance of a *doctoral school* for the field of *software architecture* that would provide young researchers and practicing architects from industry the opportunity to learn from the leaders in the field. This takes place through educating the participants in the most recent concepts, methods, and tools that are produced by the top research groups and industrial environments, in a highly interactive setting and with practical work on real industrial case studies.

Throughout the school, the 36 students worked in seven groups on the industrial case studies under the supervision of a senior researcher and in collaboration with a software/system architect from industry (from 3 large companies and one SME). The outcome of each group work was a solution to the architecting problems formulated in the respective case studies by the case owners. Those solutions are the main output of the school. Secondary outputs are the knowledge and skills that the PhD students and architects acquired during the lectures, the established bridges between academia and industry, and the open research problems that were formulated and can be considered as future work for the PhD students.

Many PhD students commented that they learned much more than they had anticipated and will use the lessons learned within their research projects. Several of them were not aware that architecting is as much a social role as it is technical. Another 'lightbulb' moment was that the discrepancies between the implemented and the ideal architecture are not necessarily a bad thing. Both PhD students and the architects admitted that they enjoyed working with each other and found links between the topic they work on and other topics covered during the school.

Organization/Format:
The first edition of the PhD school in 2017 had been overwhelmingly successful and its participants had urged the organizers to repeat it on an annual cycle. The second edition of the school aimed at consolidating the stated goals and mature the format of the school before turning it into a regular event. Specifically, we wanted to improve on the following points: preparing the software architects to make the cases more uniform and better linked to the theory; tying the lectures together in a more coherent learning path; assigning students to the industrial cases according to their background and preferences; preparing the moderators in order to optimize their role within the industrial case studies.

The 2018 school was also a great success under all perspectives. The part of the format that worked exceptionally well was the combination of lectures in the morning and case-study work in the afternoon. Another key point we plan to keep in the future is the involvement of practicing software architects from industry, as this gave the opportunity to PhD students to get in contact with real-world problems (for some of them, this was their first time) and reflect on the relevance of their (academic) research to the practice in industry. Furthermore, at the end of each day we had a short reflective plenary session where each group presented the outcome of their work.

Finally, we conducted a retrospective session at the end of the school where we asked the participants to express: a) positive feedback, b) points for improvement, c) "a-ha!" moments

they had during the school and d) items that remained a mystery. We would recommend this retrospective format to the organisers of other events, too. The participants found it very useful and we obtained valuable feedback that we can use for future instances of the school. For example, a number of participants appreciated greatly the interaction with the lecturers and the architects, the facilities and the social events, the open discussion and the combination of theory and practice. As points for improvement, we plan to structure further the daily stand-up meetings, to improve the preparation of the students before the school, to invite lecturers also from industry, and to introduce some games in the program. Given that every year a new population of participants is attending, we are extremely motivated to continue ISAPS, hopefully again at the Lorentz Center.

Organizers:
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