



The 101th European Study Group with Industry

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The Department of Mathematics of the Faculty of Science and Technology, Lisbon New University (<http://www.fct.unl.pt>) hosted, from May 5 to May 9, 2014, the 101th European Study Group with Industry (ESGI). This was the 8th ESGI edition held in Portugal.

The call launched by the organizers to companies was positively answered and four problems were selected for research during the week-long meeting:

- TAP Maintenance and Engineering (<http://www.tapme.pt/>), TAP-M&E was interested in developing a methodology for automatic generation of labouring timetabling for the
- airline maintenance technicians with the best adjustment to the predefined man work daily needs, and in accordance to labouring rules.
- EDP (<http://www.edp.pt/en/Pages/homepage.aspx>) — Using past information on published daily data identifying production and/or technologies offers by the different units for past supply curves, the goal is to match, in the daily publication of offers from various supply units, each block to the corresponding supply unit.
- SISCOG (<http://www.siscog.pt/>) — The challenge that SISCOG brought to ESGI101

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was to find an algorithm to solve a shortest path problem with additional constraints that could outperform the existing algorithm implemented in CREWS. CREWS is a product developed by SISCOG to perform the work assignments of drivers and guards on several European countries on a daily basis.

- SPIRALPACK (<http://www.spiralpack.pt/>) — In the context of tube manufacturing, there are certain processes that SPIRALPACK needed to improve. With a production totalling almost 17.5 million tubes/year, arising from more than 1500 different references corresponding to almost 100 tubes with different diameters, an important part of SPIRALPACK resources is assigned to the packing and shipping process. Optimizing these processes was the problem posed by SPIRALPACK.

The companies deemed that improvements on current implemented solutions are possible and needed as this

could bring significant impact on improving management and on reducing costs.

Although those problems were addressed mainly with tools from optimization, geometry, numerical analysis and classification, discussions benefited from contributions of participants with skills in other mathematical areas.

A definite solution was given to SPIRALPACK, while for the other problems, which were more involved, partial solutions were provided and perspectives for further improvements were presented and discussed.

The companies seemed to appreciate the results produced, and representatives from ESGIs TAP-M&E and SISCOG working groups were invited to present in the offices of these companies extensive and more detailed versions of the conclusions obtained at the end of the meeting.

We trust the 10th edition of the ESGI added a valuable contribution to strengthen ties between academia and industry in Portugal.