



ESGI119

The 119th European Study Group with Industry

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The 119th European Study Group with Industry—ESGI119 was held at *Porto Design Factory*, from June 27th to July 1st, 2016, organized by ESTGF, ESEIG, and CIICESI—*Center for Research and Innovation in Business Sciences and Informations Systems* of the Polytechnic of Porto.

This was the tenth edition in Portugal¹ of a series of events that have annually brought together academics from the most diverse areas of Mathematics with experience in solving industrial problems, for R&D transfer. Suggesting methodologies from their area of expertise, participants worked collaboratively for a week to address industrial challenges that companies face every day. About 60 researchers, from different European higher education institutions, participated in solving the following five challenges proposed by Portuguese companies.

SAVANA SHOES (footwear company with more than 27 years of existence and specialized in children's footwear) proposed the study of its packaging process. The aim was to reduce the variety of carton sizes, the waste of empty space in the interior of the cartons, and to eliminate the need to carry out the experimental procedure used by the company up to now, thus reducing packing time and increasing process efficiency.

THE LUXURY HOTEL GROUP *Douro Palace Hotel Resort @ Spa* and *Douro Royal Valley Hotel @ Spa* wanted to study the best pricing policy, by finding an algorithm that could manage the optimal price with respect to some characteristics that the company considers important.

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¹ <http://www.estgf.ipp.pt/esgi/>



Figure 1.—Representatives of Savana company meeting with researchers during the ESGI119



Figure 2.— Representative of Primavera company discussing with researchers during the ESGI119

The third problem was presented by AVELEDA S.A., the world's leading producer of *vinho verde*, exporting more than half of its annual production to more than 70 countries around the world. This company was concerned that the processing capacity of the wine house is far from its maximum, due to the irregularity of the flow of grapes throughout the day, and needed to improve the existing process (Fig. 3).

The company PRIMAVERA BSS requested an efficient scheduling algorithm in order to add new features to its production management software—that could be sufficiently generic and adaptable to be used by different industries, such as metal, furniture, wood, textile and food industry (Fig. 2).

EDP—ENERGIAS DE PORTUGAL, one of the largest energy operators in the Iberian peninsula and the largest Portuguese industrial group, presented a challenge that consisted in simulating electricity prices, not only for the purpose of calculating risk measures, but also for scenario analysis in terms of prices and strategy.

The shoe company SAVANA was also very satisfied with the solution achieved by the ESGI119 working group (Fig. 1). The representative of this company, Jorge Fernandes, said: “We think that the group that was involved in these processes presented solutions that really can make the difference in the near future. We are sure that the ESGI is a problem solver booster, using Mathematics applied to industry.



Figure 3.— The group working on the challenge proposed by Aveleda

We hope that this kind of event will show not only to companies, but also to the general public, that the science of logical and abstract reasoning is not a science that is reserved for schools but a science that is very useful in the lives of people and companies.”

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² <https://mi-network.org>