

## Visit of Advising Committee of CEOC (U. Aveiro)

January 30, 2004.

Andrey Agrachev, SISSA, Trieste, Italy

Franz Rendl, University of Klagenfurt, Austria

Andrey Sarychev, University of Florence, Italy

On January 30, 2004 the R&ID Unit CEOC (Centro de Estudos em Optimização e Controlo) has been visited by the Advising Committee. Participating in the visit were Prof. Andrey Agrachev, SISSA, Trieste, Italy, Prof. Franz Rendl, University of Klagenfurt, Austria, Prof. Andrey Sarychev, University of Florence, Italy. Short introductory remarks made by vice-rector Prof. Francisco Vaz, have been followed by presentation of various research projects of the R&ID Unit CEOC by respective coordinators.

In the afternoon the members of the advising committee made their comments regarding the planned research activities and provided several suggestions.

These suggestions refer to possible topics of research and focus on establishing closer interactions between different researchers/research projects. A brief account of the comments and suggestions made by the advising committee follows.

We find that all 4 projects of CEOC

Optimization, Graph Theory and Combinatorics  
Minimal Resistance and Mass Transfer  
Computability and Algorithms  
CoTG – Control Theory

follow interesting directions of research and have good perspectives.

In what regards Research project on **Optimization, Graph Theory and Combinatorics** the following comments can be made:

1. In studying random Random Networks an interesting topic is studying deterministic graph with random costs. In optimization theory on random graphs a robustness issue is worth studying in relation to robust optimization on graphs.
2. Another emerging topic is convex approximation for Lovasz number; there is an evidence that the convex programming approach is more effective than semidefinite programming.

In what regards **Control Theory** project there can be an interesting mix in research topic of computational geometry (art gallery problem) and optimal control considering “dynamic art gallery problem” (police car moving in order to illuminate some area and at the same time minimize a functional calculated along its path).

Once again robustness issue is of interest for the problem of minimal resistance.

**Supplementary remarks** made during a visit of A.Sarychev to CEOC on October 26, 2006.

During a meeting on October 26, 2006 activities of CEOC in the years 2004-2006 have been discussed. According to my (A.S.) impression the main lines of the research advance with success; obviously the rates of progress in different projects are different. Another impression is that there are several activities in various projects of CEOC aimed at implementation of computational algorithms in the respective studies. A recommendation (which got support of the executive committee of CEOC) was to create a transversal project in “Computational Methods in Optimization and Control” which can systemize and coordinate the activities which are so far dispersed.

Another recommendation regards establishing closer interaction between activities on non-standard methods in critical point theory and calculus of variations with the activities of **control theory project (CoTG)**, in particular, with those dealing with Calculus of Variations with fractional derivatives and with varying time scales.