

Publication in Scientific Journals

Applied Energy ■ Applied Mathematics Letters ■ Building and Environment ■ Computational Mechanics ■ Computer Modeling in Engineering & Sciences ■ Computers & Concrete ■ Computers & Operations Research ■ Computers & Structures ■ Construction and Building Materials ■ Decision Analysis ■ Decision Support Systems ■ Electric Power Systems Research ■ Energy ■ Energy and Buildings ■ Energy Policy ■ Engineering Optimization ■ Engineering Structures ■ European Journal of Industrial Engineering ■ European Journal of Operational Research ■ Finite Elements in Analysis and Design ■ Geographical Analysis ■ Group Decision and Negotiation ■ IEEE Transactions on Geoscience and Remote Sensing ■ IEEE Transactions on Sustainable Energy ■ IEEE Transactions on Vehicular Technology ■ Industrial & Engineering Chemistry Research ■ Intl. Journal for Numerical Methods in Engineering ■ Intl. Journal of Computer Applications in Technology ■ Intl. Journal of Electrical Power & Energy Systems ■ Intl. Journal of Fracture ■ Intl. Journal of Geographical Information Science ■ Intl. Journal of Information Technology & Decision Making ■ Intl. Journal of Nonlinear Mechanics ■ Intl. Journal of Remote Sensing ■ Intl. Transactions in Operational Research ■ Journal of Applied Mechanics ■ Journal of Business Logistics ■ Journal of Cleaner Production ■ Journal of Global Optimization ■ Journal of Heuristics ■ Journal of Infrastructure Systems (ASCE) ■ Journal of Intelligent Manufacturing ■ Journal of Structural Engineering (ASCE) ■ Journal of the Operational Research Society ■ Journal of Transport Geography ■ Mathematical and Computer Modelling ■ Measurement ■ Municipal Engineer (ICE) ■ Optimization ■ Remote Sensing of Environment ■ Renewable and Sustainable Energy Reviews ■ Socio-Economic Planning Sciences ■ Structural and Multidisciplinary Optimization ■ Telecommunication Systems ■ Thin-Walled Structures ■ Transportation Research - Part A: Policy and Practice ■ Transportation Research - Part B: Methodological ■ Transportation Research Record ■ Waste Management ■

Academic Involvement

INESCC researchers have supervised hundreds of PhD and MSc theses in the various fields of their expertise, integrating those works in the research activities of INESCC.

Besides their rich experience in traditional courses, they have been also involved in new initiatives such as the MIT-Portugal programmes in *Transportation Systems* and *Sustainable Energy Systems*, as well as the *Energy for Sustainability (EfS)* Initiative of the University of Coimbra.



Intervention Areas

Multiple Criteria/Objectives Decision Support

Methodologies and systems for supporting decision processes with multiple evaluation criteria ■ Multi-objective optimization and planning ■ Network optimization models and algorithms ■ Efficiency evaluation in industries and services ■ Analysis and evaluation of investment projects ■ Systems for supporting group collaboration (groupware) and negotiation processes ■ Imprecision/uncertainty in decision support ■

Teletraffic Engineering & Telecommunication Network Design

Network optimisation and traffic modelling ■ Application of Operational Research techniques to network design ■ Routing methods in IP/MPLS and WDM networks ■ Multicasting methods in IP/MPLS-WDM networks ■ Reliability in telecommunication networks ■ Resilient routing/fault recovery in communication networks ■

Spatial Planning / Sustainable Cities / Smart Mobility

Spatial decision support systems ■ Multicriteria/multiobjective spatial analysis ■ Land use, urban, transportation and environmental planning ■ Urban regeneration ■ Infrastructure planning & management ■ Location of facilities ■ Routing optimization ■ Smart mobility ■ Accessibility studies ■ Spatial data retrieval from Remote Sensing ■ Urban 3D modeling ■ Imprecision/uncertainty in geospatial modeling ■ Geographical Information Systems ■

Rational Use of Energy & Power Systems Planning

Management of demand for energy ■ Electricity consumption models ■ Energy management in buildings and evaluation of indoor air quality ■ Urban energy planning ■ Analysis of the quality of service in electricity networks ■ Electricity markets ■ Studies of energy-environment-economy interactions ■ Energy and sustainable development ■

Computational Mechanics Applied to Structural Systems

Non-linear structural analysis ■ Computational-numerical methods for large-scale systems (finite element methods and other approaches) ■ Safety evaluation of structural systems ■

INESCC

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INESC Coimbra is financed by the Portuguese Foundation for Science and Technology (FCT) under project grant UID/MULTI/00308/2013

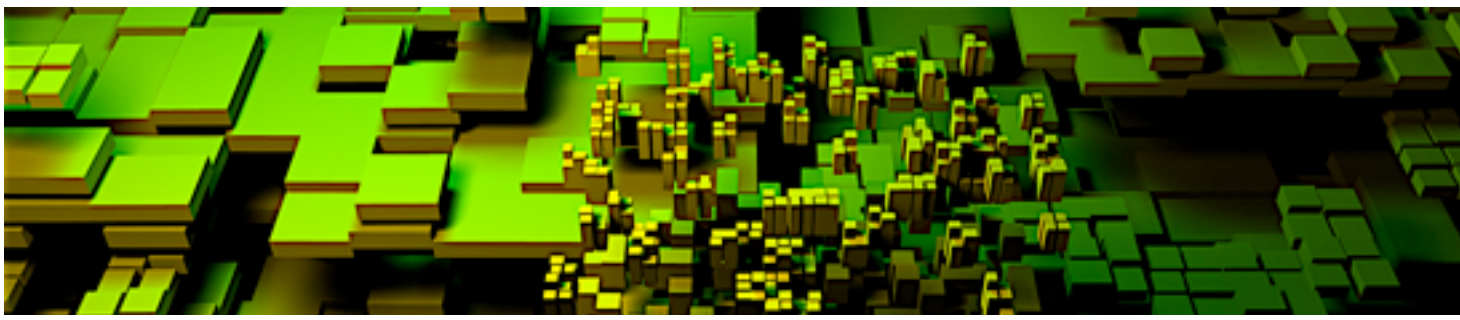


INESC Coimbra

Institute for Systems Engineering and Computers at Coimbra



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INESC Coimbra

The Institute for Systems Engineering and Computers at Coimbra (INESC Coimbra, INESCC) is a non-profit R&D institute, affiliated with the University of Coimbra (UC), the Institute for Systems Engineering and Computers (INESC) and the Polytechnic Institute of Leiria (IPL).

Mission Statement

INESC Coimbra's statutory mission is to perform scientific research, technological development, and knowledge integration and transfer, based on several disciplines of Engineering, Management Science and Operations Research (OR). INESCC aims at contributing to a better performance of businesses and institutions and to the progress of knowledge, by creatively combining theory and methodology, technical issues and human factors to tackle complex problems.

The Interdisciplinary Nature of INESCC

The most distinctive feature of INESCC is the interdisciplinary nature of its activities within a systems engineering framework.

The background fabric is given by the competences in OR models and methods, namely concerning multi-objective optimization and multi-criteria analysis, coupled with software engineering expertise to develop decision support systems that exploit those competences in several application domains.

INESCC research team is a strongly interdisciplinary group, its members affiliated with several Universities and Polytechnic Institutes. INESCC has about one hundred researchers with backgrounds in a wide range of areas (electrical engineering, economics and management, civil and geomatics engineering, mathematics, computer science, computational mechanics, physics) providing a fertile ground for cross-fertilization and a strong interdisciplinary focus with impact on research and application fields.

These different backgrounds and scientific interests allow INESC Coimbra's researchers to collaborate, addressing complex problems.

Engineering sciences are used to address management and performance analysis problems (e.g. planning, controlling, project analysis and system evaluation). Decision aiding techniques in the realm of management science are used to address engineering problems, such as energy planning and rational use of energy, telecommunication networks analysis and planning, teletraffic engineering, urban, regional and transportation planning, environmental management, computational mechanics.

Besides originating innovative theoretical and methodological work, these competences provide a fertile ground for research stemming both from specific problems in real-world application domains (namely in energy, telecommunications, urban/regional planning and computational mechanics) and the integrative use of different methodologies.

INESCC Projects

The R&D activities and competences of INESC Coimbra are recognized through contracts with the major players in the energy and telecommunications sectors, companies of road infrastructure management, global management of buildings and technical facilities, intelligent sensing, software engineering, etc. Also projects in the framework of the national scientific system, as well as international cooperation, have been developed, reinforcing and extending the institute's competences to new research avenues, and consolidating it as a renowned science centre.

Scientific Publication

A very high level of publication in international scientific journals has been maintained. INESCC researchers publish regularly in top engineering, management and OR journals, with high impact factors. The researchers are also involved in the editorial boards of international scientific journals and in the organization of technical and scientific events.

A series of "Research Reports" is available for download at INESCC's website.

