SPATIO-TEMPORAL DATA ANALYSIS

Environmental data and applications have some peculiar features that make them distinct from the typical application in applied computer science. During recent years, this has led to the emergence of *Environmental Informatics* or *Enviromatics* (Environmental Information and Decision Support Systems). This is a novel field of Applied Informatics which is concerned with the application of computer science techniques to environmental problems. The same methodological and conceptual framework is shared by *Computational Sustainability*: "an interdisciplinary field that aims to apply techniques from computer science, information science, operations research, applied mathematics, and statistics for balancing environmental, economic, and societal needs for sustainable development". The ultimate aim of these new and evolving areas of modern research is to develop computational and mathematical models to support decision making in challenging real world problems denoted by the often misused or vaguely defined concept of "sustainability".

The colloquium will provide cutting-edge data analysis and modeling tools for a variety of practical applications by presenting concepts, algorithms, and case studies related to environmental problems. Attendees can expect a series of presentations on spatio-temporal data organization, analysis, modelling.

The colloquium will be useful for beginning users as well as advanced researchers.

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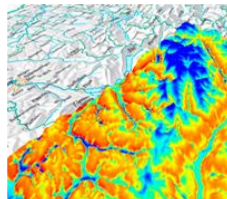
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S4 ENVISA 2010
21-22 June 2010, Cork, Ireland

Colloquium on Spatio-Temporal Data Analysis

University College Cork (UCC)
Western Gateway Building
Western Road
Room 1.07

Department of Computer Science
Cork Constraint Computation Centre

June 21st 2010

09,15 **Eugene Freuder** – Director of Cork Constraint Computation Centre (4C);
Arnaud Banos – Executive secretary of S4:
Greetings, presentation of the international research network S4 and introduction to the colloquium

09,30 **Carla Gomes** (*Keynote speaker*) – Institute for Computational Sustainability (ICS), Cornell University, U.S.A.
Computational Sustainability: Computational Methods for a Sustainable Environment, Economy, and Society

10,30 **Mikhail Kanevski** – Institute of Geomatics and Risk Analysis (IGAR), University of Lausanne, Switzerland
Machine learning and geostatistics for environmental data. Review of problems and Corresponding models

11,00 **Vasily Demyanov** – Heriot–Watt Institute, Edinburgh, U.K.
Uncertainty Quantification of geospatial models: Bayesian statistics and Machine learning

11,30 **Vadim Timonin** – Institute of Geomatics and Risk Analysis (IGAR), University of Lausanne, Switzerland
Analysis and treatment of geospatial data using Machine Learning Office

12,00 **Michele Volpi** – Institute of Geomatics and Risk Analysis (IGAR), University of Lausanne, Switzerland
Active learning of remote sensing images

12,30 *LUNCH*

14,00 **Paul Harris** – National Centre for Geocomputation (NCG), National University of Ireland, Maynooth, Ireland
Developing a Statistical Methodology to Improve Classification and Mapping of Seabed Type from Deep Water Multi-Beam Echo Sounder (MBES) Data

14,30 **Tabbasum Natz** – Cork Constraint Computation Centre (4C), University College Cork, Ireland

Managing Marine Data: Irish Case Study

15,00 **Paul Leahy** – Department of Civil Engineering, University College Cork, Ireland
Hybrid ANN model for prediction of river levels over time

15,30 **Loris Foresti** – Institute of Geomatics and Risk Analysis (IGAR), University of Lausanne, Switzerland
GeoKernels: application of kernel based methods for geo- and environmental sciences

16,00 **James Haworth, Tao Cheng, Jaiqiu Wang** – Dept. of Civil, Environmental & Geomatics Engineering, University College London, U.K.
Kernel Based approach for Space-time analysis

June 22nd 2010

09,30 **Barry O'Sullivan** – Cork Constraint Computation Centre (4C), University College Cork, Ireland
Enda Keane – Treemetrics, Cork, Ireland
Biodiversity prediction in a forest environment in Ireland

10,00 **Ioannis Dokas** – Cork Constraint Computation Centre (4C), University College Cork, Ireland
The project SCEWA - Supporting the Concept of Early Warning Analysis: A short description

10,30 **Gordon Rios, Antonino Marvuglia** – Cork Constraint Computation Centre (4C), University College Cork, Ireland
Bayesian Networks for time series forecasting

11,00 **Jiaqiu Wang, Tao Cheng** – Dept. of Civil, Environmental & Geomatics Engineering, University College London, U.K.
STARIMA for Traffic Flow Prediction

11,30 **Christian Kaiser** – National Centre for Geocomputation (NCG), National University of Ireland, Maynooth, Ireland
Analysis, simulations and geo-visualization of socio-economic and demographic data

12.00 **Beniamino Murgante, Grazia Scardaccione, Francesco Scorza, Giuseppe Las Casas** –

Laboratory of Engineering of Urban and Territorial Systems (LISUT), University of Basilicata, Italy
Spatial Autocorrelation Analysis for the Evaluation of Migration Flows: The Italian Case

12,30 *LUNCH*

14,00 **Alexei Pozdnoukhov, Fergal Walsh** – National Centre for Geocomputation (NCG), National University of Ireland, Maynooth, Ireland
Exploratory analysis for human activity pattern identification in geospatial data streams

14,30 **Vittorio Paola** – Presidenza Regione Sicilia & Sicilia@servizi, Italy
Decision support systems for complex environmental data base: de-normalization and geostatistics assessments methods

15,00 **Short presentations of different case studies.**
Practices.
General discussion.
Conclusions.

19,30 *SOCIAL DINNER*