NEWSLETTER

ASSYST
Complex Systems Society

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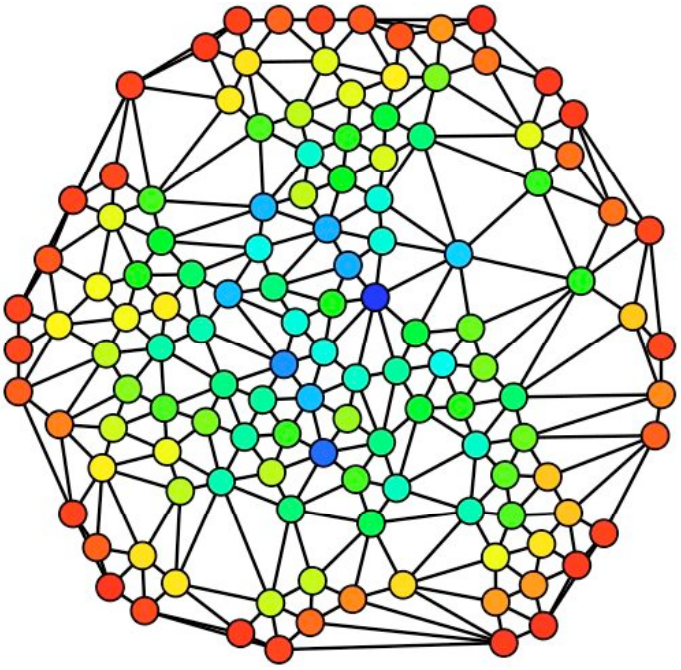


The Future of CS research is starting now

The European research in complex systems is more dynamic then ever, as it is shown by the new nine Complexity-NET *Interdisciplinary Challenges for Complexity Science* projects. This November Newsletter starts presenting the Complexity-NET projects that are about to start. Others will be mentioned in the following issues.

RESINEE - *RESilience and Interaction of Networks in Ecology and Economics* will be developed by the Universidad Carlos III de Madrid and Universidad de Alcalá in Spain, University of Cambridge and University of Manchester in UK, and Universiteit Utrecht in The Netherlands. The main goal is to explore the structure and robustness of networks under different types of threat and degrees of decision-making power for nodes in the network. The study of specific problems in economics and ecology will make the project relevant to the design and control of complex systems in real-world contexts.

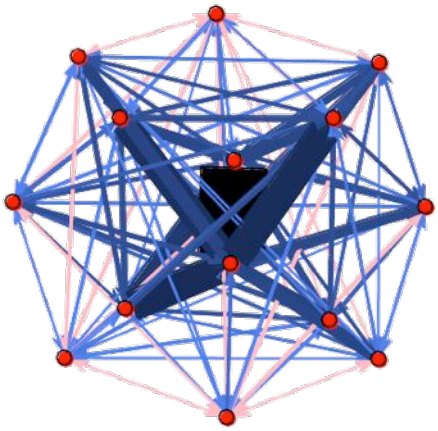
The COSMIC - *COmplexity in Spatial dynaMICs* project is linking three research groups: Spatial Economics at the Free University of Amsterdam (VU), The Centre for Advanced Spatial Analysis (CASA) at University College London (UCL), and the National Centre for Geocomputation (NCG) at the National University of Ireland at Maynooth (NUIM). The project aims to study urban dynamic processes using new bottom up, digital data collected for entire populations using web 2.0 technologies such as crowd-sourcing, GPS and more conventional data mining of large electronically available spatial data sets concerning social and economic transactions and interactions.

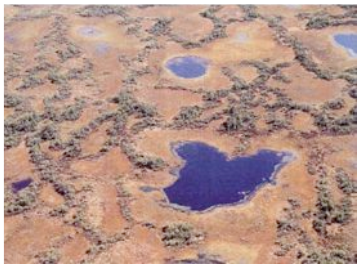
This issue of our Newsletter will also report on the recent conferences and will announce new ones, together with the now famous *Reading snippets*. We hope you will enjoy your reading.

-- The ASSYST Team

RESINEE - RESilience and Interaction of Networks in Ecology and Economics

by Anxo Sánchez





RESINEE is a project with the ERA-Net on Complexity, including groups from Universidad Carlos III de Madrid and Universidad de Alcalá in Spain, University of Cambridge and University of Manchester in UK, and Universiteit Utrecht in The Netherlands, coordinated by Anxo Sánchez at Carlos III.

RESINEE will explore the structure and robustness of networks under different types of threat and degrees of decision-making power for nodes in the network. The study of specific problems in economics and ecology makes our proposal relevant to the design and control of complex systems in real-world contexts. A common perspective of complex networks and formal representation of threats and decision-making allows cross-fertilization between both fields and insights on other contexts.

RESINEE will deal with the following specific problems and questions:

Designer vs adversary: networks of undirected links for goods or information transmission, where a designer sets the network and an adversary attacks:

How does the budget available to adversary affects robustness?

How does protection interacts with the adversary strategy?

Decentralized protection: The network is statistically known, and individuals decide on protection on the basis of local information:

How does individual protection varies with network properties?

Input for design and optimal public policies.

Robustness vs contagion: Sharing risks makes individuals more resistant, but may lead to systemic collapse.

What is the most resilient structure for different distributions of shocks?

Ecosystem collapse: Study of feedback mechanisms between plants and soil as mechanisms for the transition from ecosystems to deserts.

How is resilience jeopardized by the disruption of the interacting network through soil degradation?

Restoration ecology: Ecological restoration intends to reverse anthropogenic alteration of natural habitats, individual species vs communities:

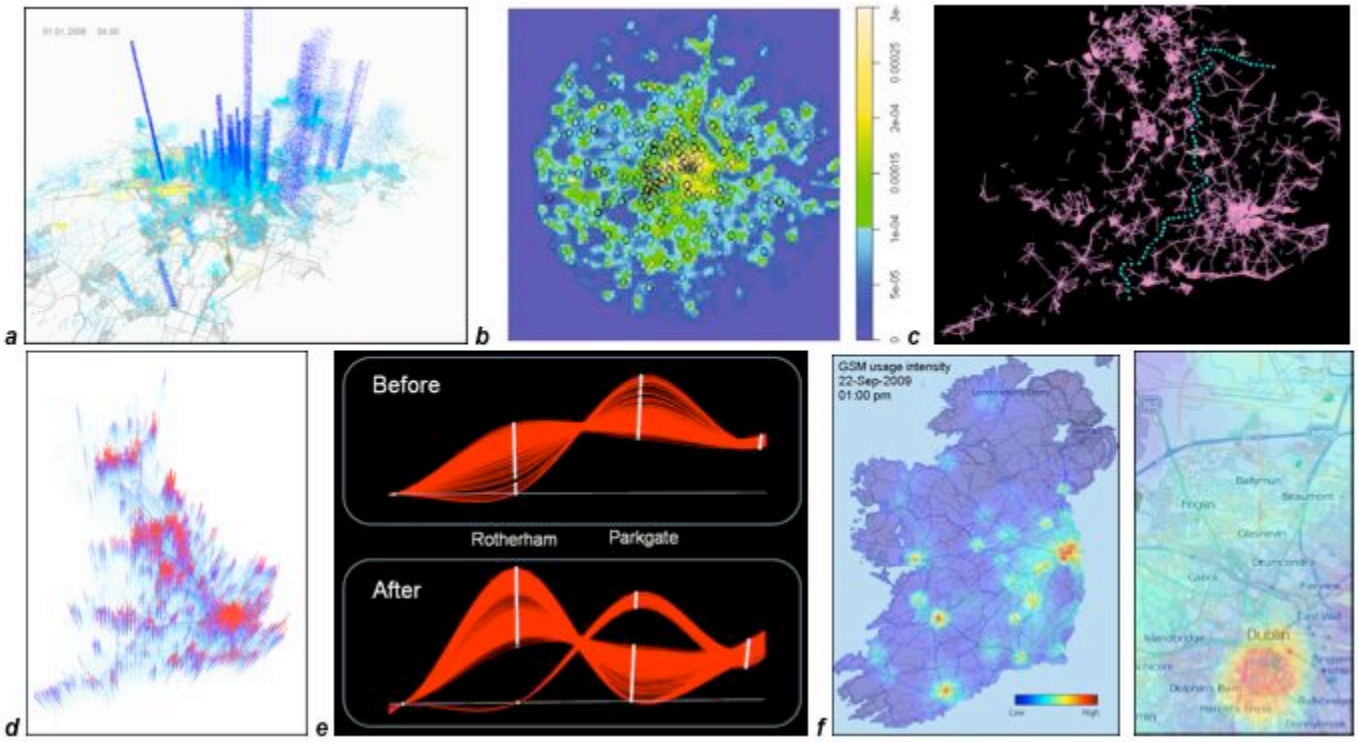
When can individual restoration be preferred to community restoration?

Link between the traditional patch-size distribution focus and a new one in terms of hydrological connectivity.

RESINEE will provide a novel approach to these issues through its link between ecology and economics, including a complex networks perspective where there are global and local agency levels, improved modelling of the robustness-contagion trade-off, integration of individual-based models, system dynamics and evolutionary dynamics, a co-evolutionary processes. Participants' expertise is a unique combination of physics/math model building capabilities, along with the interaction with practitioners in economics and ecology.

COmplexity in Spatial dynamics

by Michael Batty



The Kind of Flow and Network Data to be Collected from Real-Time and Other Digital Sources in the COSMIC Project

(a) Erlang Data Collected from Mobile Phones on 1/1/2008 in Amsterdam (b) Network Density from Ordnance Survey Digital Map and Traffic Data in Greater London (c) Community Structure Extracted from BT Land Line Data for England (d) Network Intensity from BT Land Line Data for Great Britain (e) Visualising the Phase Space of BLV Models (f) GSM Intensities in All Ireland (Eire) and the Dublin Corridor

COSMIC (**CO**mplexity in **S**patial dyna**MIC**s) is a project linking three research groups: Spatial Economics at the Free University of Amsterdam (VU), The Centre for Advanced Spatial Analysis (CASA) at University College London (UCL), and the National Centre for Geocomputation (NCG) at the National University of Ireland at Maynooth (NUIM). These centres all deal with quantitative urban science and geo-spatial analysis, and have expertise in complexity science applied to urban and regional systems.

COSMIC is a network which will tie these groups together and establish some momentum for research into urban dynamic processes using new bottom up, digital data collected for entire populations using web 2.o technologies such as crowd-sourcing, GPS and more conventional data mining of large electronically available spatial data sets concerning social and economic transactions and interactions. We believe that such data will provide dramatically new insights into urban change which manifest themselves in often discontinuous forms which can be articulated using a variety of reaction-diffusion dynamics incorporating catastrophe, chaos, bifurcations, and phase transitions. In cities, such reactions range from the emergence of edge cities to patterns of residential segregation, embodying social exclusion in various forms.

The project will first develop a typology of urban dynamic processes to guide the development of models using new digital data collected in real time from electronic transactions such as phone lines, electronic ticketing, and related geo-sensing. Our unifying focus will be on flow data associated with underlying networks with the models revolving around spatial interaction and movement from labour markets to pedestrian movement. VU will explore methods for estimating dynamic models of labour markets in Germany and urban navigation in Amsterdam, UCL will develop models of movement and location from phone and ticketing data in London, while NUIM will explore movement at in small scale environments represented at the building and streetscape scale in Dublin.

The network will be supported by three major workshops, exchanges of researchers between sites, and strong external links to other groups, in anticipation that from this pilot project, a proposal for a much wider network will emerge. **COSMIC** like all the Complexity-Net initiatives is designed not only to indulge the interests of the researchers involved but also to widen these ideas to the European community of complexity scientists and beyond. External links to groups dealing with urban complexity around the world will be strengthened and besides the usual deliverables of such a project, papers, demonstrations, web dissemination, the pilot project will lead to a proposal for wider programme of work in this domain.

SASO 2010 Brief Report

Fourth IEEE International Conference on Self-Adaptive and Self-Organizing Systems Budapest, Hungary, September 27-October 1, 2010

by Stefano Balietti

Saso 2010 conference took place at the Europa Congress Center, 20 minutes away from the city center, to help scientists to not get distracted by the beauty of the city of Budapest. I believe the trick worked well, since besides the official talks, people gathered and discussed actively during the breaks and I have seen a few collaboration ideas be born in the hall of the Congress Center.

The first two days (Monday-Tuesday) of the conference have been dedicated to workshops and tutorial sessions, which were a kind of smaller conferences focused on specific topics. I attended the QLectives project meeting, and the QTESO workshop. At the QTESO workshop, several speakers gave talks, but what I have found more interesting was the final round table about the pros and cons of scholarly peer-review, where Dirk Helbing, Santo Fortunato and Mark Buchanan (who has been editor of Nature for many years) confronted themselves on the question whether peer-review is still the best mechanism to spot out quality in Science.

As for the following days of the conference, my attendance and attention has been quite limited due the fore coming VISIONEER deadlines. Anyway, everything went smooth as it was planned in the conference program. Among others, I liked the talk of Vinayak Ranad, about a "Distributed Control for Small Customer Energy Demand Management".

Overall, the workshop was well organized and participants seemed satisfied (most of them stayed until the very last talk). The social event was a dinner to a traditional Hungarian restaurant, where food was delicious and waiters were pouring wine with strange bottles.... A final curiosity was that at the restaurant of the hotel you had to protect carefully your dish from quite pressing waiters who were lurking around the tables to take way your plate as soon as you stop eating.

SASO2010 http://www.inf.u-szeged.hu/saso10/

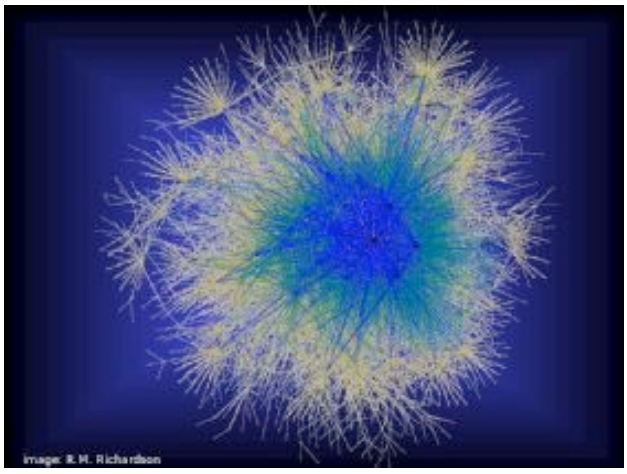
4th China-Europe Summer School on Complexity Science

by Zhang Yi-Cheng

The 4th China-Europe Summer School on Complexity Science was successfully held in Shanghai, China on 11th-14th Aug, 2010. This international conference was sponsored by European Union ASSYST Project, University of Shanghai for Science and Technology and East China University of Science and technology. Around one hundred and fifty researchers and scholars attended the summer school. This summer school provided a platform for researchers who work in the fields of economics, finance, complexity science and come from area including Europe, China, and the Asia-Pacific, to discuss and exchange innovation ideas. We invited many pioneer experts to introduce fundamental theories, new topics, and report their works in these fields. By holding the school, we aims to strengthen collaboration between China, European and the Asia-Pacific area, and quicken applications and researching programs of complexity science in economics, finance, physics, Biology, IT and other felids. Besides the main sessions, we arranged a poster section for young researchers to present their progress on the relevant subjects.

Winter School in Network Theory and Applications

The **Centre for Complexity Science** of the University of Warwick in the UK, will host the **2011 Winter School in Network Theory and Applications** taking place during January 5-8, 2011.



A network is simply a collection of nodes and a set of edges linking them. A diverse range of phenomena in physics, biology, social sciences and beyond can be naturally modeled as a network. The neural structure of the brain, networks of protein-protein interactions, social networks and the Internet provide clear and commonly cited examples. When the ability of a network to encode static connections between entities is combined with dynamics defined on that network, the modeling power of this developing field becomes immense.

This winter school will provide a pedagogical introduction to network theory and dynamics with an emphasis on practical algorithms and applications across a range of disciplines. Lectures will be aimed at graduate students in mathematics, complexity science and related disciplines. There will also be a number of research talks which will give students an insight into the cutting edge of research in the field and provide an opportunity to stimulate discussion and an exchange of ideas among the experts.

Website: http://www2.warwick.ac.uk/fac/cross_fac/comcom/events/networks2011/

Reading snippets

Synchronizing distant nodes: a universal classification of networks

Stability of synchronization in delay-coupled networks generally depends in a complicated way on the coupling topology. We show that for large coupling delays synchronizability relates in a simple way to the spectral properties of the network topology.

In arXiv http://arxiv.org/abs/1009.6120

EU-funded scientists clinch Nobel Prize in Physics, Europe at top of research game

Graphene is unique in that it is extremely rigid with super mechanical and electronic properties. Using Scotch tape (sticky tape), the material was extracted from a piece of graphite like the kind we find in our pencils. Tests show that the stretchy graphene layers are nearly 100% transparent, making them excellent conductors of heat and electricity.

In Cordis http://assystcomplexity.eu/short/?id=80

I am my connectome

Sebastian Seung is mapping a massively ambitious new model of the brain that focuses on the connections between each neuron. He calls it our "connectome," and it's as individual as our genome -- and understanding it could open a new way to understand our brains and our minds.

In TED http://assystcomplexity.eu/short/?id=81

The World as Evolving Information

(…) the benefits of describing the world as information, especially in the study of the evolution of life and cognition. Traditional studies encounter problems because it is difficult to describe life and cognition in terms of matter and energy, since their laws are valid only at the physical scale. However, if matter and energy, as well as life and cognition, are described in terms of information, evolution can be described consistently as information becoming more complex.

In arXiv http://arxiv.org/abs/0704.0304

Curiosity and Pleasure

Heuristic decision making received wide attention due to the work of Tversky and Kahneman (1981) and inspired multiple studies of irrationality of the human mind and a fundamental disregard for knowledge. But what is the source of all human knowledge, including heuristics? (…)This paper connects curiosity, knowledge, cognition, emotions, including aesthetic emotions of the beautiful, mechanisms of drives, high cognitive functions, minimization of cognitive effort through heuristics, and knowledge maximization.

In arXiv http://arxiv.org/abs/1010.3009

Robots ‘think’ with their hands

Actions speak louder than words, particularly if you are a robot. At least that is the theory proposed by a major European effort to develop a wholly new approach to robotic cognition. (…) Our universe demonstrates astounding complexity from a handful of universal constants and DNA consists of just four bases, but from these all lives emerge. Researchers at PACO-PLUS hope to imitate to some degree that level of complexity, the complexity that arises from the absurdly simple.

In Cordis http://assystcomplexity.eu/short/?id=82

Evolving hypernetwork model

Complex hypernetworks are ubiquitous in real-life systems. While a substantial body of previous research has only focused on the applications of hypernetworks, relatively little work has investigated the evolving models of hypernetworks. Considering the formations of many real world networks, we propose two evolving mechanisms of the hyperedge growth and the hyperedge preferential attachment, then construct an evolving hypernetwork model. We introduce some basic topological quantities, such as a variety of degree distributions, clustering coefficients as well as average path length.

In EPJ B http://assystcomplexity.eu/short/?id=83

2 or 3 things you should know about Social Networks before registering yourself on FarmVille or…

Precursors of social networks in the late 1800s include Émile Durkheim and Ferdinand Tönnies. Tönnies argued that social groups can exist as personal and direct social ties that either link individuals who share values and belief (gemeinschaft) or impersonal, formal, and instrumental social links (gesellschaft)(...)

In Chemoton http://assystcomplexity.eu/short/?id=84

Conferences and workshops

http://assystcomplexity.eu/conferences.jsp

IBERAMIA 2010
12th edition of the Ibero-American Conference on Artificial Intelligence
BahÃ-a Blanca, Argentina
1 Nov 2010 to 5 Nov 2010

Econophysics Colloquium 2010
Econophysics Colloquium 2010
Taipei, Taiwan
4 Nov 2010 to 6 Nov 2010

ServAgents 2010
First International Workshop on Services and Agents
Kolkata, India
12 Nov 2010 to 15 Nov 2010

PRIMA-2010
The 13th International Conference on Principles and Practice of Multi-Agent Systems
Kolkata, India
12 Nov 2010 to 15 Nov 2010

INCoS 2010
International Conference on Intelligent Networking and Collaborative Systems
Thessaloniki, Greece
24 Nov 2010 to 26 Nov 2010

Bionetics 2010
5th International ICST Conference on Bio-Inspired Models of Network, Information, and Computing Systems

1 Dec 2010 to 3 Dec 2010

CSSWC@NIPS2010
Computational Social Science and the Wisdom of Crowds Workshop at NIPS 2010
Whistler, Canada
10 Dec 2010 to 11 Dec 2010

Extreme Environmental Events
Extreme Environmental Events
Selwyn College - Cambridge, United Kingdom
13 Dec 2010 to 17 Dec 2010

ACIT2010
International Arab Conference on Information Technology
University of Garyounis in Banghazi, Libya
14 Dec 2010 to 16 Dec 2010

IMSAA10
4th International Conference on Internet Multimedia Systems Architecture and Application
Bangalore, India
15 Dec 2010 to 17 Dec 2010

BASNA10
IEEE International Workshop on Business Application of Social Network Analysis
Bangalore, India
15 Dec 2010 to 15 Dec 2010

EUMAS2010
8th European Workshop on Multi-Agent Systems
Pars, France
16 Dec 2010 to 17 Dec 2010

ICAART2011
3rd International Conference on Agents and Artificial Intelligence
Rome, Italy
28 Jan 2011 to 30 Jan 2011

WiVS 2011
1st International Workshop WiVS 2011: Flexible Workflows in Distributed Systems
Kiel, Germany
8 Mar 2011 to 11 Mar 2011

SIMUTools 2011
4th International Conference on Simulation Tools and Techniques
Barcelona, Spain
21 Mar 2011 to 25 Mar 2011

IMCIC 2011
The 2nd International Multi-Conference on Complexity, Informatics and Cybernetics
Orlando, Florida USA
27 Mar 2011 to 30 Mar 2011

SKIN2011
Simulating Knowledge Dynamics in Innovation Networks: Workshop
University of Koblenz-Landau, Koblenz, Germany
31 Mar 2011 to 1 Apr 2011

ADS11
Agent-Directed Simulation Symposium
Boston Marriott Long Wharf Hotel; Boston, MA, USA
4 Apr 2011 to 9 Apr 2011

ISAmI 2011
2nd International Symposium on Ambient Intelligence - Software and Applications
Salamanca, Spain
6 Apr 2011 to 8 Apr 2011

PAAMS11
9th International Conference on Practical Applications of Agents and Multi-Agent Systems
Salamanca, Spain
6 Apr 2011 to 8 Apr 2011

WSS 2011
The 4th International Symposium on Web Services
Hammamet, Tunisia
20 Apr 2011 to 21 Apr 2011

AAMAS 2011
The Tenth International Conference on Autonomous Agents and Multiagent Systems
Taipei, Taiwan
2 May 2011 to 5 May 2011

WIIAT2011
The 2011 IEEE / WIC / ACM International Conferences on Web Intelligence and Intelligent Agent Technology
Campus Scientifique de la Doua, Lyon, France
22 Aug 2011 to 27 Aug 2011

SPSD2011
International Community on Spatial Planning and Sustainable Development
Kanazawa, Japan
29 Aug 2011 to 31 Aug 2011

Jobs

http://jobs.cssociety.org

Postdoc/Lecturer
Research Associate: Theoretical Physics
School of Physics & Astronomy, University of Manchester
United Kingdom – Fri 19 of Nov., 2010

Postdoc/Lecturer
Modelling of biological systems and statistical physics
Laboratoire IMNC CNRS UMR 8165/Université Paris Sud-11/Université Paris Diderot-Paris 7
France - Fri 31 of Dec., 2010

Postdoc/Lecturer
Statistical methods for the brain functional connectivity networks : robustness, fusion with anatomical connectivity.
Grenoble Institute of Neuroscience (http://neurosciences.ujf-grenoble.fr/) and the department of Images and Signal within the GIPSA-lab laboratory, France (http://www.gipsa-lab.inpg.fr/) - Sat 01 of Jan., 2011

Postdoc/Lecturer
Studentship & Post-Doctoral Fellowship in Quantitative Biology
Laboratoire de Spectrométrie Physique in Grenoble
France – Sun 02 of Jan., 2011

Graduate Research Assistant
PhD candidate in Agent-Based Modeling
University of Arizona, Tucson
USA – (http://udallcenter.arizona.edu/wrpg/cnh/)

Letters to ASSYST

Dear Editors

I would like to draw your attention to the efforts of my joint chief editor Joachim Sturmberg and my self - in relation to the forum of systems and complexity in health, which has now published 7 editions in the Journal of Evaluation in Clinical Practice published by Wiley Blackwell. I attach the latest forum for your perusal. See http://www.wiley.com/bw/journal.asp?ref=1356-1294

Also I am joint chief editor with Joachim Sturmberg on a Handbook on Systems and Complexity in Health. I would like to inform your readers of these activities and invite them to submit articles for both these peer reviewed publications. We are knowledge translators for the clinical evaluation world, thus the previously published highly technical work or theoretical work 'explained' would be very suitable.

Carmel Martin

Contacts

ASSYST - Action for the Science of complex SYstems and Socially intelligent icT

Web: http://assystcomplexity.eu
RSS: http://assystcomplexity.eu/rss.xml
Twitter: http://twitter.com/assystcomplex
FriendFeed: http://friendfeed.com/assystcomplex
Email: newsletter@assystcomplexity.eu

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CSS – Complex Systems Society

Web: http://cssociety.org
RSS: http://cssociety.org/tiki-calendars_rss.php
Suggestions: http://cssociety.org/suggestions

Contributors to this edition:

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Story submission guidelines:

If you are a Complex System researcher/practitioner and want to share a success story about your work / research please submit it to **newsletter@assystcomplexity.eu.** The story should be no longer than 500 words (if you want to submit an extended story please contact us) and should be sent in ODT, RTF, DOC or TXT format.