

1-year post-doctoral position

in Mathematics and Computation in the area of nonlinear and complex systems is available from september 1, 2014 at the ISCN (Complex Systems Institute, LMAH lab., in Normandie, France)

supervised by Prof. M. Aziz-Alaoui, LMAH

Funding

This post-doctoral position is proposed thanks to the financial support of R.I.S.C (Réseaux d'Interactions et Systèmes Complexes: Interaction Networks and Complex Systems) project FEDER (European Regional Development Fund) on complex networks and applications as part of regional GRR (Grand Réseau de Recherche) within CPER (Contrat Projet Etat Région).

Main research areas

This post-doctoral position is a pluridisciplinary transversal work concerning different scientific areas such as :

- *complex networks
 - *dynamical processes on complex networks
 - *applied mathematics (mainly **coupled PDE**, from the dynamical system point of view: asymptotic analysis of reaction-diffusion systems, Stability, patterns formation, Hopf or Turing bifurcations, ...)
 - *morphogenesis of complex networks
 - *non-linear dynamics
 - *computational mathematics
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Subject

The primary goal of the ISCN (the research Institute of Complex Systems of Normandy) at University of Le Havre (Normandy, France) is to foster research activity that highlights scientific computation as a complementary avenue to theory and experiment. More about ISCN can be found at <http://isc-n.fr/>

We consider complex systems as systems of interacting elements. From these interactions can emerge some properties which cannot be deduced from the conventional analysis of its components. Our objective is not only to analyse and control complex networks belonging to such complex systems, but also to work on the reconstruction of the system complexity.

In this context, the study of complex systems in terms of interaction networks are of main interest. The aim of this post-doctoral position is to study complex network dynamics according to their structural or morphological properties. Theoretical results are expected and numerical implementations will be achieved.

As an example, networks composed of dynamical systems (non-linear PDE, DDE, ODE) connected through coupling functions can be considered. Indeed, some work on this kind of networks has already been performed within the LMAH (ISCN and LITIS). We mainly focus on how does the dynamics of individuals have implications on the network global behaviour and on how does the network motion modify the entities behaviours. These questions will be also treated in terms of topology, dynamics, morphogenesis ...

Based on the study of some interaction networks modelling, mainly via PDE, biological problems or ecosystems, the idea is to contribute to the mathematical formalization of the notion of "complexity". The candidate will contribute to the overall research efforts of both the LMAH Laboratory and the ISCN, working hand in hand on the formalization of complexity notion, PDE theoretical and computational.

We are looking for enthusiastic candidates with a research background in applied mathematics, non-linear

dynamics, PDE and computation.

Useful Information

*The candidate must be a Ph.D. in (applied) mathematics, enable to demonstrate a strong foundation in PDE modeling, non-linear dynamics and computation.

*The annual salary will be around 1770 € a month (for 12 months). A limited budget will also be available for supporting this project (participation to conferences, ...).

*To apply, please submit a resume, a publications list, at least 2 recommendation letters and a cover letter outlining current research interests by e-mail to :

aziz.alaoui@univ-lehavre.fr

precising in the “subject” of the email that you apply for this post-doctoral position.

*Deadline for applications: september 01, 2014.

Interested candidates are welcome to contact us to discuss the position and the project.