

Research scientist in Applied Mathematics

Modelling and analysis of ecosystems

Keywords: graphs, flows, polyhedra, optimisation, modelling, dynamical systems.

Duration : 8 to 12 months with possible renewal starting in the fall of 2019

Salary : about 2200€/month

Context

The Laboratoire de Mathématiques de l'INSA Rouen Normandie (LMI – EA3226, FR CNRS 3335) offers a position of research scientist (ingénieur de recherche) for the project ECUME. This project involving several biology laboratories, aims at studying the impact on oyster culture of fields of wind turbines. We study graph models for ecosystems.

First, we will study static models corresponding to flow models in graphs typically studied in operations research. The problem is original because these flows (CO₂ exchanges) are difficult to measure in situ; we would like to estimate the values carried by the edges of the graph following different criteria, study the polyhedron of feasible solutions and identify an objective function (which is not known).

In a second phase we will consider dynamical models, i.e. ordinary differential equations involving the graph Laplacian.

Computations will first be done on a local LMI server and then on the servers of the CRIANN computing center of Normandie.

Background of the candidate :

We expect a solid training in applied mathematics, computer science or operations research (good level M5/ engineering degree or doctorate). The research associate will have the opportunity to participate in the development of models with the team of researchers. He will implement these models on a work station dedicated to the project. He should have one or several experiences of code development for scientific computing. Know-how in parallel computing would be a plus. Finally, we will encourage the research scientist to present the results in scientific conferences and co-author research articles.

Application :

Send an email together with a curriculum vitae and letter of intent to Jean-Guy Caputo and Arnaud Knippel caputo@insa-rouen.fr, arnaud.knippel@insa-rouen.fr .