PROBLEM DESCRIPTION

Approximation of wind velocity field from sparse datasets, taking into account the topography, is a crucial step in order to build wind turbine farm.

CHALLENGES AND GOALS

Regular approximation of the wind velocity field
Optimal visualization of the wind field simulation

MATHEMATICAL AND COMPUTATIONAL METHODS

The problem of vector field approximation from sparse data emerges in a wide range of fields such as: motion control, computer vision, geometrical analysis, geometrical design, analysis of acoustic or electromagnetic waves, as well as in geophysics, medical imaging, fluid mechanics and so on... Many different approaches have been introduced to solve each specific problem occurring in the above fields of investigation to fit the vector field dataset. In this work, we use a regularized least-square problem defined on a space of potentials.
e@lin: Wind velocity field approximation

Wind velocity field approximation: Modelling and visualization on real datasets

Results and Benefits

We have developed cutting-edge technologies for rigorous wind velocity field approximation from sparse datasets.

The underlying mathematical techniques form the cornerstone of very challenging collaborations between LMI INSA Rouen and Energy industry.

Building new wind farms

A unique modelling and visualization algorithm for greening the economy

LMI, INSA Rouen Normandie, France

ENGIE Green, France