

La Lettre de la CIPMA

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Grands événements

- Défenses de thèses de doctorat
- Soutenances de Master
- Mission d'enseignement du Professeur Moacyr Araujo

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Photo 1, ICMPA, Mars 2018 ;
Professeurs FONTON Noël et
AGBAHUNGBA Georges,
Enseignants/CIPMA

SAGESSE / SAGACITY

CITATIONS CELEBRES

- ❖ "Notre pouvoir scientifique a dépassé notre pouvoir spirituel. Nous savons guider des missiles mais nous détournons l'homme de sa voie."
Martin Luther King
- ❖ "Tout grand progrès scientifique est né d'une nouvelle audace de l'imagination."
John Dewey
- ❖ "La découverte scientifique ne peut pas être meilleure que le sexe, mais la satisfaction dure plus longtemps."
Stephen Hawking
- ❖ "L'invention scientifique réside dans la création d'une hypothèse heureuse et féconde ; elle est donnée par le génie même du savant qui l'a créée."
Claude Bernard


"Aucune société ne peut se développer si elle n'est capable de produire et de partager des connaissances."

Hkn



PROVERBES ET EXPRESSIONS

IDIOMATIQUES

- ✓ Les jours se mesurent par ce qu'on fait.
The better day, the better deed.
- ✓ Qui trop embrasse, mal étreint.
Grasp all, lose all.
- ✓ Qui n'ose rien n'a rien.
Nothing ventured, nothing gained.
- ✓ Savoir, c'est pouvoir.
Knowledge is power.
- ✓ Tout vient à point à qui sait attendre.
All things come to him who waits.
- ✓ Une hirondelle ne fait pas le printemps.
One swallow doesn't make a summer.

Défense de thèse de doctorat de Monsieur ATTOGOUINON André, 20 mars 2018

Title of subject: "RAINFALL VARIABILITY AND ATMOSPHERIC GENERAL CIRCULATION MODEL (AGCM) OVER the UPPER OUÉMÉ VALLEY (BENIN)".

Abstract

"This research work evaluated the general circulation models implemented in the Upper Ouémé river Valley (HVO) in the Republic of Benin in West African subregion during the fifth assessment report on climate change. For the characterization of the climatic situation of the study area, the rainfall data observed through a discretization of the rainy season into several characteristics relating to the frequency and intensity of rainfall, the length of dry sequences, the extent and occurrence of extreme precipitation were analyzed. The determination of these characteristics in the observed rainfall data and in the data simulated by eight general circulation models assessed the representativeness of rainfall simulations in the Upper Ouémé river Valley. The Mann-Whitney-Wilcoxon test and several statistical criteria were used. According to the results, the models tend to drizzle. They are unable to reproduce extreme precipitation. The reproduction changes from one station to another and from one season to another. Rainfall simulations are characterized by a high frequency of low intensity rains. The models cannot satisfactorily reproduce the natural variability of the series either. However, all models are effective in simulating rainfall totals in the first and third quarters and in part in the fourth quarter. Similarly, they represent the average daily rainfall from 1951 to 2005 in the first and third quarters and partly in the fourth quarter. By comparing the model results, we concluded that it is not obvious to say that a model is better than others because all models have advantages and limitations. The best way is to work with several methods and compare the results. But taking into account the parameters studied in this research, we can say that MPI-ESM-LR and CanESM2 are the best follow-up of the GFDL-ESM2M and CNRM-CM5 models in the rainfall simulation on the Upper Ouémé valley in the Republic of Benin. "

Keywords: Climate change, rainfall simulation, scenario, Upper Ouémé valley, Republic of Benin."

Défense de thèse de doctorat de KOUWAYE Bienvenue

Title of subject: Contributions of statistical learning to GLMM and LASSO methods: Application to statistical modeling of malaria morbidity at Tori-Bossito (Benin)

Abstract

"The subject of this Thesis is the identification of environmental factors that may explain the variability of anopheline density at village and home scale and the determination malaria risk exposure in the study area. We consider these problems as variables selection and prediction problems in epidemiology context. Then, the main objective is the selection of an optimal subset of variables for the prediction of malaria risk exposure in the study area and also in another area where the entomological data are not available. In the first part of the Thesis, we propose one method based on GLMM algorithm combined with a backward process for variables selection. Random effects are used at each hierarchy level of data for taking account the possible correlation because of the hierarchical structure of the data. This method provides an optimal subset of variables for prediction of malaria risk. But algorithm do not converge when some explanatory variables are too correlated or if data have a particular structure. For overcoming this, we propose in the second part an automatic machine learning method. We have generated automatically interactions between variables. The variables selection is performed by this automatic machine learning method based on Lasso and stratified two levels cross validation. Selected variables are unbiased while the prediction is generated by simple GLM (Generalized linear model). The results of this method reveal to be qualitatively better, at selection, the prediction, and the CPU time point of view than those obtained in the first part. Finally, the best subset of prediction contains: Season; interaction between Mean rainfall and openings; interaction between Rainy days before mission and Number of inhabitants; interaction between Rainy days during the mission and Vegetation."

Keywords: Malaria, variables selection, prediction, cross validation.



Photo 2, ICMPA, Mars 2018



Photo 3, ICMPA, Mars 2018



Le jeudi 22 mars 2018 ont eu lieu dans le *Seminarium 1 Daniel Iagolnitzer*, les soutenances de mémoires de master de deux étudiants en Physique Mathématique de la Matière (PMM), promotion 2014-2015, devant une importante assemblée et des jurys spécialement locaux. Les deux impétrants ont obtenu in fine leurs diplômes de master avec une très bonne mention. La CIPMA toujours en marche!

SOUTENANCE DE MASTER EN PMM DE FANOU JONAS

Abstract

The compatibility condition of n -Lie algebra structures is given. The relations connecting compatible hereditary structures of given compatible n -Lie algebra structures are obtained. It is proved that the set of all mutually compatible n -Lie algebra structures forms a vector space. Moreover, for a given k -algebra A , a triple Poisson algebra is defined, inducing a 3-ary Poisson algebra on the associated representation space of A , and on the commutative algebra $A/[A,A]$, where $[A,A]$ is the linear span of commutators $ab - ba$ ($a, b \in A$). Then, a trace map tr is defined and satisfies the relations: $\{tr(a), tr(b), c\} = \{a, b, c\}$ and $\{tr(a), tr(b), tr(c)\} = tr\{a, b, c\}$, on $A/[A,A]$, a non-commutative version of Schouten-Nijenhuis bracket, and of graded commutative algebra is given.

Keywords: n -Lie algebra, n -Poisson (Nambu) bracket, triple Poisson algebra, n double graded commutative algebra.

SOUTENANCE DE MASTER EN PMM DE KAKPO CYRILLE

Abstract

An electron moving on the plane in a uniform magnetic field which is orthogonal to the plane, is known as the Landau problem. Adopting the non commutative q -calculus, we generalized the work by P-M. Zhang and P. A. Horváthy [68], when the symmetries of motion are conserved and the limit free of q is equal to 1. Then, considering momenta and coordinates of the non commutative phase space, and introducing a generalized eigen value problem, we obtain the Wigner functions for the exotic particles.

Keywords: Landau problem, exotic particles, q -deformation, Wigner functions.



Photo 4, ICMPA, Mars 2018



Photo 5, ICMPA, Mars 2018

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Intitulé du Cours : Turbulence

"De façon générale, on peut dire que les étudiants étaient très intéressés par le sujet et ainsi il a été possible de leur transmettre les bases de turbulence et du mélange dans les systèmes géophysiques, en mettant l'accent dans l'atmosphère et l'océan. Outre les aspects théoriques, nous avons consacré une partie importante des heures de cours sur les formulations de fermeture des systèmes de Reynolds (fermeture de la turbulence), avec la présentation des paramétrisations le plus souvent utilisées dans différents types de modèles mathématiques et numériques (rivières/fleuves, régions côtières /plateforme et offshore/échelle du bassin), en particulier les limites et avantages de chaque approche.

En général, il a été constaté aussi que les étudiants promotion 2017-2018 ont un domaine des concepts de base de la Mécanique des Fluides plus limité par rapport aux élèves de la classe précédente (2016-2017). Il est donc souhaité leur encadrement pendant leurs stages pour combler ces lacunes. Il est également nécessaire que les élèves suivent des activités de formation leur permettant d'être plus débrouillards lorsqu'ils présentent leurs résultats en public (talks)."



Photo 6, ICMPA, Mars 2018



Photo 7, ICMPA, Mars 2018

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