



AVIS DE SOUTENANCE D'UNE THESE DE DOCTORAT

Le Doyen de la Faculté des Sciences a le plaisir d'informer le public qu'une soutenance de
thèse de Doctorat en

«**Mathématiques, Informatique et Applications**»

aura lieu le 06/07/2024 à la Faculté des Sciences, Kénitra

La Thèse sera présentée par Mr TAMMOUCH ILYAS

Sous le thème :

**Artificial Intelligence towards Building Education Reform: A New Approach to Automatic
Data Clustering**

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Sujet de thèse :

Artificial Intelligence towards Building Education Reform: A New Approach to Automatic Data Clustering

Abstract:

In recent decades, the issue of growing inequalities has become a significant concern, impacting vulnerable populations in societies around the world. Among those affected, students bear the brunt of these challenges. The social vulnerability of students arises from a complex interplay of individual and environmental factors that gradually accumulate over a period of time. Factors such as poverty, material deprivation, and limited parental education can have profound effects on students' academic performance and assessment outcomes. and while efforts have been made to reform education systems, it is evident that the school reform movement remains unfinished business. Graduation requirements and expectations have been raised in many states, yet regional disparities in academic performance persist. Despite attempts to improve educational quality and reduce failing ratios, The main goal of this research is to pinpoint areas where Moroccan students exhibit both low academic achievement and heightened social vulnerability. To accomplish this, an unsupervised deep learning approach called "Deep Embedding Clustering" and "Centroid Neural Network" is employed to cluster students based on their social vulnerability and academic performance. The results are subsequently visualized through a choropleth map, offering a clear representation of the findings. To conduct this research, the study utilizes the PISA 2018 dataset, which encompasses a wide range of individual student responses and plausible values reflecting their cognitive abilities. Through careful analysis, the study concludes that the region of "DakhlaOued Eddahab" exhibits the lowest performance level and the highest social vulnerability. Additionally, concerns are raised for the "Béni Mellal-Khénifra" and "Oriental" regions. These findings emphasize the urgent need for academicians and policymakers to incorporate targeted measures into their policies, aiming to improve educational outcomes in these regions and address the challenges faced by vulnerable students.