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# UNIVERSIDAD PERUANA UNIÓN

## ESCUELA DE POSGRADO

Unidad de Posgrado de Ingeniería y Arquitectura



### **Modelo de clasificación del desempeño laboral apoyado en redes neuronales para instituciones universitarias**

Trabajo de Investigación para obtener el Grado Académico de Maestro en  
Ingeniería de Sistemas con mención en Dirección y Gestión en Tecnología de  
Información

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Lima, febrero de 2026

## DECLARACIÓN JURADA DE ORIGINALIDAD DE TRABAJO DE INVESTIGACIÓN

Yo López Gonzales Javier Linkolk, docente de la Unidad de Posgrado de Ingeniería y Arquitectura, Escuela de Posgrado de la Universidad Peruana Unión.

DECLARO:

Que la presente investigación titulada: **“MODELO DE CLASIFICACIÓN DEL DESEMPEÑO LABORAL APOYADO EN REDES NEURONALES PARA INSTITUCIONES UNIVERSITARIAS”** del autor Huaman Fernandez Ivan Wilmer tiene un índice de similitud de 8 % verificable en el informe del programa Turnitin, y fue realizada en la Universidad Peruana Unión bajo mi dirección.

En tal sentido asumo la responsabilidad que corresponde ante cualquier falsedad u omisión de los documentos como de la información aportada, firmo la presente declaración en la ciudad de Lima, a los 13 días del mes de febrero del año 2026.



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López Gonzales Javier Linkolk

## ACTA DE SUSTENTACIÓN DE TRABAJO DE INVESTIGACIÓN

En Lima, Ñaña, Villa unión a los 13 del mes de febrero del año 2026, siendo las 9:00 horas, se reunieron de forma online sincrónica, bajo la dirección del presidenta del jurado Dra. Ethel Altez Ortiz, el secretario Mtro. Carlos Daniel Abanto Ramírez; los demás miembros: el Dr.Sc. Esteban Tocto Cano, el Mg. Lennin Henry Centurión Julca y el asesor PhD. Javier Linkolk López Gonzales. con el propósito de administrar el acto académico de sustentación de Trabajo de investigación titulada "Modelo de clasificación para el desempeño Laboral apoyado en redes neuronales para instituciones universitarias", conducente al Grado Académico de Maestro en Ingeniería de Sistemas con mención en Dirección y Gestión de Tecnologías de Información.

El presidente inició el acto académico de sustentación invitando a los candidatos hacer uso del tiempo determinado para su exposición. Concluida la exposición, el Presidente invitó a los demás miembros del Jurado a efectuar las preguntas, cuestionamientos y aclaraciones pertinentes, los cuales fueron absueltos por el candidato. Luego se produjo un receso para las deliberaciones y la emisión de los dictaminadores del Jurado.


Posteriormente, el jurado procedió a dejar constancia escrita sobre la evaluación en la presente acta, con el dictamen siguiente:

Candidato: Ivan Wilmer Huaman Fernández

CALIFICACIÓN	ESCALAS			Mérito
	Vigesimal	Literal	Cualitativa	
Aprobado	18	A-	Muy Bueno	Sobresaliente

(\*) Ver parte posterior

Finalmente, el presidente del Jurado invitó a los candidatos para recibir la evaluación final. Además, el presidente del Jurado concluyó el acto académico de sustentación, procediéndose a registrar las firmas respectivas.



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Presidente
secretario

\_\_\_\_\_

Asesor(a)
Miembro
Miembro

\_\_\_\_\_

Candidato

## **Agradecimientos**

A Dios, por brindarme sabiduría y fortaleza en todo el proceso.

A mi esposa, por su motivación, apoyo incondicional y compañía.

A mi hija, por ser mi mayor inspiración y motivación diaria.

A mi asesor, por su orientación académica y confianza en el desarrollo de esta investigación.

A la Escuela de Posgrado, por contribuir a mi formación profesional y crecimiento como investigador.

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Article

# Classification model for job performance supported by neural networks for University institutions.

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## 1. Introduction

A group of collaborators, composed of psychologists and administrative staff, after reviewing ways to measure job performance, decided to implement the methodology based on functions and general and specific competencies developed by Martha Alles [1]. Based on this methodology, a web-based software was implemented [2] to evaluate performance. The performance evaluation is conducted once a year and involves teaching, non-teaching, administrative, and management staff [3].

Competency-based job performance is a modern method of human talent management that not only measures a worker's achievements, but also the way in which he or she achieves them, i.e., the skills he or she uses to reach his or her goals. Martha Alles, a leader in human resources management in Latin America, proposes a structured approach that directly links the skills model to performance evaluation, accounting for both technical and behavioral skills.

According to Alles, competencies are a set of knowledge, skills, and attitudes that are observable and affect job performance. They can be measured with objective tests. His approach uses tools such as the assessment center, 360°, 180°, and 90° assessment, competency interviews, and behavioral scales to ensure a comprehensive examination of individual and group performance [4].

According to Martha Alles methodology, performance is also defined as the observed display of abilities, behaviors, and knowledge aligned with the role and strategy. The model consists of a list of competencies, sets of competencies, a job profile with clearly defined functions, and individual development plans. [5]

Numerous international organizations have adopted Martha Alles's methodology. In Colombia, a competency-based microbusiness management model has been implemented using Alles' methodology to assess and develop employee competencies [6]. In the academic field, 360-degree competency-based evaluation has also been used to improve student performance in educational institutions [7].

In different countries, Martha Alles is not explicitly mentioned, but performance evaluations based on competencies aligned with the methodology she proposes have been implemented. La National Distance Education University UNED (Spain) and the Catholic University of Santiago de Guayaquil (Ecuador) they have designed a competency-based training model for teachers and education professionals with the aim of evaluating competencies and their great importance in the teaching process the results show that teachers between the ages of 25 and 35 prefer to value planning,

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communication, evaluation, methodology, digital, and tutoring skills, while those over 55 emphasize the importance of digital and innovation skills. [8]

In Peru, studies were conducted using a non-experimental, cross-sectional design with a descriptive-propositional approach. The results showed deficiencies in specific processes related to personnel selection and hiring, as well as a lack of incentives affecting staff development and motivation. When the model was implemented in human resources, it proved effective in improving work performance. [9]

## **2. Related work**

Performance is a key factor in a company's success, and research on artificial intelligence has been conducted in various countries. This is illustrated in the following study, which uses traditional methods such as KPIs and 360° evaluations, although these methods have limitations in capturing the complex aspects of job performance. To overcome these limitations, machine learning-based techniques allow for the processing of large amounts of multidimensional data, improving predictive capabilities. BP neural network models have demonstrated the capability to detect nonlinear trends in labor variables, leading to outcomes that are both more precise and scalable [10,11].

In any part of the world, without a doubt, a company's success lies in the good performance of its employees. Thanks to the good performance of the employees, productivity is improved. Identifying underperforming employees is a strategic step toward implementing improvements. In this regard, they use artificial intelligence to perform a comparative analysis of different algorithms to classify performance based on various factors. [12]

In matters related to employee behavior, he made predictions about staff turnover using machine learning algorithms, among which Logistic Regression, Decision Tree, Random Forest, Neural Networks, and Support Vector Machine stood out for their effectiveness in predicting employee turnover, for which employee data was used. It is particularly noteworthy that the Random Forest algorithm is the most widely used technique because it achieved the highest index and accuracy. [13]

Artificial intelligence is playing an important role in the management of human talent in companies, from recruitment processes and employee retention to improving worker performance. Human talent management is a strategic area in companies that want to achieve better performance in the key factor: the worker. In this research, predictive analysis is performed in human resource management, examining machine learning algorithms including XGBoost, SVM, random forest, and linear regression, with the result that using this technology can automate human resource processes. However, it does not ignore important concerns regarding data privacy, resistance to change, and biases in algorithms, for which it is important to adopt theoretical frameworks regarding the use of AI [14].