Universidad Politécnica de Tulancingo

Informe Trimestral de Actividades

Dirección de Investigación y Posgrado

Trimestre	octubre-diciembre	**Fecha**	13 de diciembre de 2021

Componente	3. Investigación	**Actividad**	3.1 Productos de Investigación
Nombre del Indicador	Porcentaje de productos de investigación científica y tecnológica realizados		
Resumen Narrativo	3.1 Realización de productos de investigación científica y tecnológica de educación superior		
Supuestos	Los investigadores participan en las convocatorias para el desarrollo de proyectos de investigación científica y tecnológica.		
Medios de Verificación	Informe trimestral de productos de investigación científica y tecnológica realizados generado y ubicado en la Dirección de Investigación y Posgrado adscrito a la Secretaria Académica de la Universidad Politécnica de Tulancingo.		

Metas Trimestrales			
Programada	4	**Alcanzada**	4

Descripción de Actividades

En el periodo octubre - diciembre 2021 se programaron 4 metas, que derivan en 4 productos de investigación. Estos productos de investigación o artículos de corte científico tecnológico fueron presentados en revistas de corte internacional y son los siguientes:

1.-Nombre del artículo: **Digital Marketing Strategies for the Survival of Micro-Businesses in Tulancingo de Bravo, Hidalgo, México**

2.-Nombre del artículo: **A profile-based sentiment-aware approach for depression detection in social media**

3.-Nombre del artículo: **Revealing traces of depression through personal statements analysis in social media**

4.-Nombre del artículo**: Highly Discriminative Physiological Parameters for Thermal**

Pattern Classification

Desarrollo de Actividades y Evidencia Fotográfica

En el periodo enero – diciembre 2021 se programaron 10 metas, que derivan en 10 productos de investigación. Estos productos de investigación o artículos de corte científico tecnológico fueron presentados en revistas de corte internacional y son los siguientes:

1.-*Nombre del artículo*: **Digital Marketing Strategies for the Survival of Micro-Businesses in Tulancingo de Bravo, Hidalgo, México**

Autores: **Claudia Vega Hernández1*, Liliana de Jesús Gordillo Benavente**, Juan Carlos Nery Guzmán *****

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Revista: **Journal of Hunan University (Natural Sciences)**

Link: **http://jonuns.com/index.php/journal/article/view/804**

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Open Access Article

Digital Marketing Strategies for the Survival of Micro-Businesses in Tulancingo de Bravo, Hidalgo, Mexico

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Abstract: Currently, technology has changed and has led each business to stay in the digital age. The advertising media have changed enormously. Previously the use of the press and TV were the most recurrent. This is how marketing has had to evolve along with this change so much that today digital marketing has become a valuable mechanism to improve the quality of life and access to goods and services to meet the population's needs. This research aims to design digital marketing strategies that contribute to the survival of microenterprises in Tulancingo de Bravo Hidalgo, Mexico, as the main tool for doing business. The scientific and technological impact is that the Internet has become the best way to carry a brand everywhere since it does not have territorial or cultural limits, unlike other media. The method used was with a quantitative approach, with a non-experimental, trans-sectional correlational research design. What was sought was to see the relationship digital marketing strategies have with the survival of microenterprises in Tulancingo de Bravo Hidalgo, Mexico. Digital marketing has become one of the fundamental pillars of any business since it offers unbeatable advantages, ranging from basic advertising to improving sales. Large companies have made digital marketing one of their strategic axes, and for micro, small and medium-sized companies, it is essential that they also carry out digital marketing strategies to get ahead in the market, face competition, and it will last in time. For this research, the SPSS statistical package was used with the confirmatory factor analysis inference statistic, with the Principal Component Analysis technique, which allowed measuring the association between the digital marketing variables with survival. The main results showed that the digital marketing strategy plays an important role for survival among the strategies that can be cited: use of WhatsApp, Facebook, Instagram, email, profile on google, website, use of advertising videos, Facebook watch, Periscope, Servifast alliances, content generation, Google Ads.

Keywords: digital marketing, micro-business, small businesses, survival.

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2.-*Nombre del artículo*: **A profile-based sentiment-aware approach for depression detection in social media**

Autores: **José de Jesús Titla-Tlatelpa, Rosa María Ortega-Mendoza2*, Manuel Montes-y-Gómez and Luis Villaseñor-Pineda**

(*Profesores de Tiempo Completo del Doctorado en Optomecatrónica, Universidad Politécnica de Tulancingo, Hgo. México.)

Revista: **EPJ Data Science**

Link: **https://epjdatascience.springeropen.com/articles/10.1140/epjds/s13688-021-00309-3**

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A profile-based sentiment-aware approach for depression detection in social media

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Abstract

Depression is a severe mental health problem. Due to its relevance, the development of computational tools for its detection has attracted increasing attention in recent years. In this context, several research works have addressed the problem using word-based approaches (e.g., a bag of words). This type of representation has shown to be useful, indicating that words act as linguistic markers of depression. However, we believe that in addition to words, their contexts contain implicitly valuable information that could be inferred and exploited to enhance the detection of signs of depression. Specifically, we explore the use of user's characteristics and the expressed sentiments in the messages as context insights. The main idea is that the words' discriminative value depends on the characteristics of the person who is writing and on the polarity of the messages where they occur. Hence, this paper introduces a new approach based on specializing the framework of classification to profiles of users (e.g., males or women) and considering the sentiments expressed in the messages through a new text representation that captures their polarity (e.g., positive or negative). The proposed approach was evaluated on benchmark datasets from social media; the results achieved are encouraging, since they outperform those of state-of-the-art corresponding to computationally more expensive methods.

Keywords: Depression detection; Author profiling; Sentiment analysis

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3.-*Nombre del artículo*: **Revealing traces of depression through personal statements analysis in social media**

Autores: **Rosa María Ortega-Mendoza*, Delia Irazú Hernández-Farías **, Manuel Montes-y-Gómez**, Luis Villaseñor-Pineda**.**

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Revealing traces of depression through personal statements analysis in social media

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ABSTRACT

Depression is a common and very important health issue with serious effects in the daily life of people. Recently, several researchers have explored the analysis of user-generated data in social media to detect and diagnose signs of this mental disorder in individuals. In this regard, we tackled the depression detection task in social media considering the idea that terms located in phrases exposing personal statements (i.e., phrases characterized by the use of singular first person pronouns) have a special value for revealing signs of depression. First, we assessed the value of the personal statements for depression detection in social media. Second, we adapted an automatic approach that emphasizes the personal statements by means of a feature selection method and a term weighting scheme. Finally, we addressed the task in hand as an early detection problem, where the aim is to detect traces of depression with as much anticipation as possible. For evaluating these ideas, benchmark Reddit data for depression detection was used. The obtained results indicate that the personal statements have high relevance for revealing traces of depression. Furthermore, the results on early scenarios demonstrated that the proposed approach achieves high competitiveness compared with state-of-the-art methods, while maintaining its simplicity and interpretability.

4.-*Nombre del artículo*: **Highly Discriminative Physiological Parameters for Thermal Pattern Classification**

Autores: **Laura Benita Alvarado-Cruz*, Carina Toxqui-Quitl **, Raúl Castro-Ortega* , Alfonso Padilla-Vivanco** and José Humberto Arroyo-Núñez*****

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Highly Discriminative Physiological Parameters for Thermal Pattern Classification

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Abstract: Infrared Thermography (IRT) is a non-contact, non-intrusive, and non-ionizing radiation tool used for detecting breast lesions. This paper analyzes the surface temperature distribution (STD) on an optimal Region of Interest (RoI) for extraction of suitable internal heat source parameters. The physiological parameters are estimated through the inverse solution of the bio-heat equation and the STD of suspicious areas related to the hottest spots of the RoI. To reach these values, the STD is analyzed by means the Depth-Intensity-Radius (D-I-R) measurement model and the fitting method of Lorentz curve. A highly discriminative pattern vector composed of the extracted physiological parameters is proposed to classify normal and abnormal breast thermograms. A well-defined RoI is delimited at a radial distance, determined by the Support Vector Machines (SVM). Nevertheless, this distance is less than or equal to 1.8 cm due to the maximum temperature location close to the boundary image. The methodology is applied to 87 breast thermograms that belong to the Database for Mastology Research with Infrared Image (*DMR-IR*). This methodology does not apply any image enhancements or normalization of input data. At an optimal position, the three-dimensional scattergrams show a correct separation between normal and abnormal thermograms. In other cases, the feature vectors are highly correlated. According to our experimental results, the proposed pattern vector extracted at optimal position $d = 1.6$ cm reaches the highest sensitivity, specificity, and accuracy. Even more, the proposed technique utilizes a reduced number of physiological parameters to obtain a Correct Rate Classification (CRC) of 100%. The precision assessment confirms the performance superiority of the proposed method compared with other techniques for the breast thermogram classification of the *DMR-IR*.

Keywords: breast thermography; heat source parameters; feature extraction; infrared imaging; D-I-R model

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Citation: Alvarado-Cruz, L.B.; Toxqui-Quitl, C.; Castro-Ortega, R.; Padilla-Vivanco, A.; Arroyo-Núñez, J.H. Highly Discriminative Physiological Parameters for Thermal Pattern Classification. Sensors 2021, 21, 7751. https://doi.org/10.3390/s21227751

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