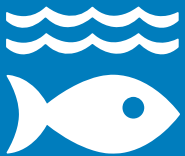




SUSTAINABLE DEVELOPMENT GOALS

14 LIFE BELOW
WATER



Cleanup of La Chira beach



In June and October 2023, a cleanup of La Chira Beach, located in the district of Chorrillos, was carried out. This activity was organized by the La Chira Concessionaire, the Municipality of Lima, and the Association of Fishermen of La Chira. Students from the Environmental Engineering program at UPC were invited to participate in the activity.

The objective of this initiative was to promote student participation in the beach cleanup and raise awareness about the importance of conserving our beaches and their biodiversity. Additionally, it aimed to generate collective value by working with different entities for the common good.



The beneficiaries of this initiative were the residents of the communities near La Chira Beach. In this way, it contributed to the development of Sustainable Development Goal 14: Life Below Water.



The musical industry and the disruption caused by digital technology. The tropical bass independent music scene in Lima city



Authors: Bailon, J.E. | Roncoroni, U.

Abstract: This article analyzes the disruptive effects of digital technology in the music industry. We will carry out a critical analysis of Yúdice's positions around the Music 2.0 model and Chris Anderson's long tail theory. We will analyze what the artists' adaptation process to this new cultural ecosystem has been like, taking as a case study the production and distribution strategies of the tropical bass electronic music scene in Lima city. Chicha music is the foundation of this style and genre, which, in addition to being an interesting aesthetic phenomenon, also has great social importance: it designates forms of socialization of a large sector of the Peruvian population and is the result of migrations from rural areas to the capital city, the informal economy, and the political crisis.

Keywords: Majors, culturepreneurship, digital cumbia, tropical bass, electronic music, EDM, digital audio workstation.

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An autonomous navigation system for an unmanned surface vehicle for plastic waste collection



Authors: Figueroa, P.| Marsano, L.| Vinces, L.| Vargas, D.

Abstract: This article proposes the design of an autonomous navigation system intended for Unmanned Surface Vehicles (USVs) in the form of catamarans with differential propulsion, whose primary function is the collection of plastic waste in aquatic environments such as seas and lakes. The fundamental goal of this system is to optimize the operational capabilities of the USVs by increasing their navigational autonomy, consequently reducing the costs associated with their operation and production. In this context, the vehicle has been mathematically modeled, and a navigation system composed of four essential components has been established. The first component involves heading control, which utilizes GPS and IMU to estimate the orientation of the USV. The second component is the obstacle avoidance system, which employs a lidar sensor. The third component is a collection system that relies on a computer vision model with convolutional neural networks to detect different types of plastics and manage the collection process. Finally, an architecture has been designed to facilitate the interconnection of all the aforementioned control systems.

Keywords: Artificial Intelligence; Autonomous Robot; Computer Vision; Navigation System; Plastic Contamination; Unmanned Surface Vehicle

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Influence of geometric configurations of recycled plastic micropiles on the safety factor of coastal slopes: Case study of the slope adjacent to the Manuel Bonilla-Peru port complex



Authors: Velita, Sadit Acuna; Contreras, David Cuevas; Polanco, Lydice Salome Estrada

Abstract: This scientific article presents a comprehensive analysis of geometric configurations of recycled plastic micropiles for slope stabilization in challenging coastal environments. The study focuses on the Miraflores slope in the Costa Verde area of Lima, Peru. The research includes a detailed investigation of the soil's geotechnical properties and slope conditions, followed by the design of different geometric configurations of recycled plastic micropiles. These configurations undergo numerical analysis using the PLAXIS 2D software to evaluate the slope stability under various scenarios. The obtained results, this study contributes to the advancement of knowledge in the field of civil engineering and provides specific and applicable data that can have a direct impact on engineering projects in similar geographical areas, promoting informed decision-making and a more sustainable approach in engineering practice.

Keywords: coastal zone, geometric configurations, micropiles, recycled plastic, slope stability

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Design of a Cryogenic Duplex Pressure-Swirl Atomizer through CFDs for the Cold Conservation of Marine Products



Authors: Ayala, E.| Rivera, D.| Ronceros, J.| Vinces, N.| Ronceros, G.

Abstract: The following article proposes the design of a bi-centrifugal atomizer that allows the interaction of sprays from two fluids (water and liquid nitrogen). The liquid nitrogen (LN₂) is below $-195.8\text{ }^{\circ}\text{C}$, a temperature low enough for the nitrogen, upon contact with the atomized water, to cause heat loss and bring it to its freezing point. The objective is to convert the water droplets present in the spray into ice. Upon falling, the ice particles can be dispersed, covering the largest possible area of the seafood products intended for cold preservation. All these phenomena related to the interaction of two fluids and heat exchange are due to the bi-centrifugal atomizer, which positions the two centrifugal atomizers concentrically, resulting in the inevitable collision of the two sprays. Each of these atomizers will be designed using a mathematical model and CFDs tools. The latter will provide a better study of the flow behavior of both fluids inside and outside the bi-centrifugal atomizer. Hence, the objective revolves around confirming the validity of the mathematical model through a comparison with numerical simulation data. This comparison establishes a strong correlation (with a maximum variance of 1.94% for the water atomizer and 10% for the LN₂ atomizer), thereby ensuring precise manufacturing specifications for the atomizers. It is important to highlight that, in order to achieve the enhanced resolution and comprehension of the



Design of a Cryogenic Duplex Pressure-Swirl Atomizer through CFDs for the Cold Conservation of Marine Products



fluid both inside and outside the duplex atomizer, two types of meshes were utilized, ensuring the utilization of the optimal option. Similarly, the aforementioned meshes were generated using two distinct software platforms, namely ANSYS Meshing (tetrahedral mesh) and ANSYS ICEM (hexahedral mesh), to facilitate a comparative analysis of the mesh quality obtained. This comprehension facilitated the observation of water temperature during its interaction with liquid nitrogen, ultimately ensuring the freezing of water droplets at the atomizer's outlet. This objective aligns seamlessly with the primary goal of this study, which revolves around the preservation of seafood products through cold techniques. This particular attribute holds potential for various applications, including cooling processes for food products.

Keywords: Ansys Fluent; CFD; Abramovich theory; Kliachko theory; multiphase VOF; cryogenic atomizer; liquid nitrogen; open-end pressure-swirl atomizer; closed pressure-swirl atomizer

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