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## Patent Search

Invention Title	ARTIFICIAL INTELLIGENCE BASED APPROACH TO ANALYSE THE BISMUTH SILVER PNICTOHALIDE ALTERNATIVE TO PEROVSKITE IN FULLY TRIPLE MESOSCOPIC SOLAR CELLS
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#### Abstract:

The invention relates to a system and method to develop an AI algorithm to analyze and optimize the Bismuth Silver Pnictohalide alternative to Perovskite in fully printable mesoscopic solar cells. The invention involved following steps for developing an algorithm, data collection for collecting data on the synthesis, processing, and characterization of Bismuth Silver Pnictohalide materials, as well as data on the performance of solar cells made using these materials. Data pre-processing for pre-processing the data for use in the algorithm. This may involve cleaning and filtering the data, normalizing the data to a common scale, and splitting the data into training and testing sets. Feature engineering to identify relevant features that are predictive of solar cell performance, such as the composition of the Bismuth Silver Pnictohalide material, the processing conditions, and the device architecture. Feature engineering may also involve combining multiple features to create new, more informative features. Machine learning model selection: Select an appropriate machine learning algorithm to train on the data. For example, supervised learning algorithms or unsupervised learning algorithms. Model training: Train the selected machine learning algorithm on the training data set, using the identified features as input and the solar cell performance as the output. Model evaluation: Evaluate the trained model on the testing data set to assess its accuracy and generalization ability. Model optimization to optimize the trained model to improve its generalization ability. Model Deployment to deploy the optimized model to predict the performance of new solar cells based on their composition and processing conditions. The model can be used to guide the design and optimization of solar cells based on Bismuth Silver Pnictohalide materials, and to identify the most promising materials and processing conditions for further experimental studies.

#### Complete Specification

Description:FIELD OF THE INVENTION

[01] The embodiments of the present invention generally relates to the field of fully printable triple mesoscopic solar cells and Artificial Intelligence. More particular present invention relates to a Artificial Intelligence based approach to analyse the Bismuth Silver Pnictohalide alternative to Perovskite in fully printable triple mesoscopic solar cells.

BACKGROUND OF THE INVENTION

[02] The following description of related art is intended to provide background information pertaining to the field of the disclosure. This section may include certain of the art that may be related to various features of the present disclosure. However, it should be appreciated that this section be used only to enhance the understanding of the reader with respect to the present disclosure, and not as admissions of prior art.

[03] Perovskite solar cells (PSCs) are evolving quickly, and the road to commercialization is well under way. To reach remarkable performance, the present fabrication methods for highly efficient PSCs, however, call for high-quality Perovskite layers, which are challenging to produce on a wide scale. With a promising power conversion efficiency (PCE) of up to 16.53%, printable triple-mesoscopic solar cells (TM-SCs) opened a new chapter of PSCs and satisfy the scale-up commercialization requirements such as low cost and simple manufacture. TM-SCs consist of mesoporous TiO<sub>2</sub> and ZnO layers covered with a porous carbon film. In contrast to traditional PSCs, the

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