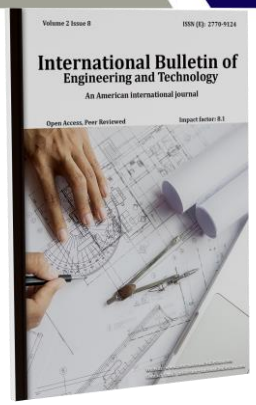

IMPORTANCE OF PYTHON PROGRAMMING LANGUAGE IN MACHINE LEARNING.

Sultonov Sarvar Mahammadodilovich
Teacher of the ATT department of Fergana branch of TATU
https://doi.org/10.5281/zenodo.8374719

ANNOTATION

Python programming language plays a crucial role in machine learning. Python's syntax is straightforward, making it both beginner-friendly and a friendly environment for those new to machine learning. Its simplicity allows developers to focus on logic and algorithms without spending time on complex syntax. This article discusses the importance of the python programming language in machine learning.

Keywords: machine learning, artificial neural networks, Python, Scikit-learn, TensorFlow.

In recent years, the machine learning language "Python" has been playing an increasingly important role in the field of programming. This language provides a powerful set of tools and libraries for rapidly developing and implementing complex machine learning solutions. In recent years, Python has developed state-of-the-art artificial neural networks that are used to solve problems as diverse as natural language processing, computer vision, and text and sentiment analysis. One popular library in the Python ecosystem is scikit-learn, which can be used to quickly build complex machine learning models. Using Scikit-learn, you can easily download datasets, split them into training and testing, apply various feature search and pre-processing algorithms, build models using the parameters of these algorithms, various metrics such as accuracy evaluating the model performance on, adjusting the parameters as necessary and finally producing the trained model[1].

Another popular Python library for machine learning is TensorFlow, which offers more features than scikit-learn, allowing developers to easily build multi-layer deep neural networks using a high-level API. With TensorFlow, complex architectures such as Convolutional Neural Networks (CNN) can be used, which are very effective in tasks such as image recognition or text classification, which can show better results compared to other classical machine learning algorithms, such as SVM. In addition, GPU support in TENSORFLOW can be used to accelerate learning when working with high-dimensional datasets. In addition to being used in deep neural networks, Python libraries provide more flexibility in implementing traditional techniques such as clustering or natural language processing (NLP). With tools like Nltk (Natural Language Toolkit) or gensim, all kinds of algorithms can be accessed that require special software like Latent Dirichlet Allocation (LDA) or Word2Vec. This allows developers to quickly experiment with different techniques without resorting to writing their own programs from scratch, saving time and getting good results through optimized code already implemented in these libraries. Thus, Python has become an invaluable tool for developing complex machine learning solutions thanks to its extensive set

[1] Sultonov , S. (2023). MASHINALI O'QITISH TUSHUNCHASI VA MASHINALI O'QITISH JARAYONINING UMUMIY QADAMLARI. *Engineering Problems and Innovations*. извлечено от https://fer-teach.uz/index.php/epai/article/view/145

of powerful libraries for working with data and building models, which is why it has seen tremendous growth over the past few years. no wonder what he experienced. This trend is expected to continue for the foreseeable future, making Python an indispensable part of the toolset of any developer who wants to stay abreast of cutting-edge AI and data science technologies.

In a world where decisions are made based on data, machine learning is becoming increasingly important to modern business. The use of libraries such as scikit-learn and TensorFlow, based on the Python coding language, allows the practical application of artificial neural networks[2].

Machine learning is often used to automate a variety of processes, from speech recognition and natural language processing to object recognition through deep learning. The use of machine learning is particularly useful in the field of text sentiment analysis. It involves analyzing the mood of the text and identifying the emotions of the person in order to make effective decisions. Scikit-learn is a Python library that makes machine learning easy and accessible for all users, regardless of their level of training. It includes several algorithms, including principal component analysis (PCA), decision tree-based classification (CART), and naive Bayesian classification; they are implemented in the scikit-learn library, making them easy to access for developers and data scientists.

Scikit-learn can also prepare datasets with numerical feature scaling or standardization, create training and test partitions to evaluate the accuracy of models on datasets, and calculate model evaluation metrics such as accuracy curves. allows you to perform the initial processing steps [3].

TensorFlow is another popular machine learning library built in Python that provides a number of capabilities that make it easy for developers to build models from scratch or customize existing models in terms of parameter optimization methods and regularization options, making TensorFlow a huge makes it suitable for many scale tasks when working with large data processing scenarios. Using the GPU (GPU). The most impressive feature of using TensorFlow is its ability to provide a simple way to build neural network architectures that have been continuously improved since its release in 2015, with convolutional neural networks (CNNs) as close as automatic image recognition scenarios. expands the possibilities of solving problems. Typically, natural language processing approaches such as text sentiment analysis use architectures based on sequence models, as they focus on understanding word order rather than individual words occurring among large datasets. ' more focused, from long comments to short tweets with comment content. learning on hundreds, if not thousands, of data samples until reaching optimal performance as measured on test data sets stored against the original set containing all learned records. In general, scikit learn offers a ready-made solution that does not require pre-processing, but if necessary, obtaining more complex solutions using architectures based on sequence models, which are more suitable for natural language processing, has become popular in recent years. considering, one can switch to TensorFlow without any problems.

[2] Abdullajonova, N. (2023). PYTHON DASTURLASH TILIDA CHIZIQLI REGRESSIYA TASHKIL QILISHNING SODDA USULLARI. *Engineering problems and innovations*.

[3] Mashrabjonovich, O. J. (2023). Axborot-ta'lim jarayonida bo'lajak o'qituvchining kasbiy kompetentsiyasini shakllantirish. Markaziy Osiyo ijtimoiy Fanlar va Tarix jurnali, 4(2), 107-111.

In summary, Python's simplicity, extensive libraries, flexibility, supportive community, integration capabilities, and industry adoption make it a powerful and widely used programming language in the field of machine learning.

References:

1. Sultonov , S. (2023). MASHINALI O'QITISH TUSHUNCHASI VA MASHINALI O'QITISH JARAYONINING UMUMIY QADAMLARI. Engineering Problems and Innovations. https://fer-teach.uz/index.php/epai/article/view/145.
2. Abdullajonova, N. (2023). PYTHON DASTURLASH TILIDA CHIZIQLI REGRESSIYA TASHKIL QILISHNING SODDA USULLARI. Engineering problems and innovations.
3. Mashrabjonovich, O. J. (2023). Axborot-ta'lim jarayonida bo'lajak o'qituvchining kasbiy kompetentsiyasini shakllantirish. Markaziy Osiyo ijtimoiy Fanlar va Tarix jurnali, 4(2), 107-111.
4. Rajabov, M., Rajabova, X., & Sultonov, S. (2023). MAKIAVELLIAN SHAXSINING O'ZIGA XOS XUSUSIYATLARI VA UNI ADABIYOTLARDAGI TA'RIFI. Engineering problems and innovations.
5. Хайдаров, А., Султонов, С., & Билолов, И. (2022). ВЛИЯНИЕ ОТЖИГА НА РАЗМЕРЫ КРИСТАЛЛИЧЕСКИХ ЛАМЕЛЕЙ ПОЛИКАПРАМИДА. Theoretical aspects in the formation of pedagogical sciences, 1(7), 319-321.
6. Isroilov, S. (2023). PEDAGOGIK FAOLIYATDA TA'LIM METODLARI VA INNOVATSION METODLARNING O'RNI VA AFZALLIK TOMONLARI. Engineering problems and innovations.
7. Qodirov, X., & Abdullajonova, N. (2023). HAMKORLIK PEDAGOGIKASINING INSONPARVARLIK HUSUSIYATLARINI SHAKLLANTIRISHDAGI AHAMIYATI. Scientific journal of the Fergana State University, (1), 560-563.
8. Uktamovich, B. I. (2023). THE ADVANTAGE AND DISADVANTAGES OF USING PYTHON AND DJANHO FRAMEWORK TECHNOLOGIES IN CREATING THE SERVER PART OF THE PLATFORM. PEDAGOGS jurnali, 31(3), 124-126.