



IBM AI MODEL(MOD1)

Introducing IBM Watson Studio

Machine learning models

Machine learning is, in the end, about making predictions using statistics and calculus; both of which are used in bits of code called **machine learning algorithms**. These bits of code, in turn, can be organized in large-scale computer programs called **machine learning models**. Your understanding of machine learning and how it's executed in **IBM Watson Studio** starts with an exploration of these two concepts.

- **Machine learning algorithm**

A **machine learning algorithm** is a set of program code. If you've ever worked with code, you might know what a **function** is. A function is a set of logical operations that inputs some sort of data, analyzes or transforms it, and then outputs a result. But in a machine learning algorithm, that analysis often has a specific goal: to recognize patterns in data sets. For example, an algorithm in an AI weather prediction system might ingest a series of sunlight measurements and water temperatures, then analyze and output a pattern describing how these factors appear to influence each other.

- **Machine learning model**

A **machine learning model** is a group of machine learning algorithms. Operating together, they detect patterns among their algorithms' output and use those patterns to make predictions. For example, a model whose algorithms look at patterns regarding temperature, climate, geography, and so on might predict a rainy-day next Saturday.

How is this different from the way conventional computer programs operate? A machine learning model doesn't depend only on a human to write its code or to adjust its programming if its predictions aren't right. Instead, **a machine learning model can reprogram itself**. So if, for example, a weather model tends to get a certain type of prediction wrong, it can adjust its algorithms (weights and biases, statistical constructs) to improve the accuracy of its predictions.

Why are you learning about this? Because creating machine learning models is the primary job of IBM Watson Studio. Its integrated development environment (IDE) makes this difficult task easier, faster, and more affordable. This is the future of computer programming.

Early model development problems

Watson Studio was born from a need

Until about 2015, artificial intelligence scientists found that building AI systems was cumbersome and time-consuming. They might need to search the web, review components, hand-code connections to big data tools and learn to use them, and more. This was an expensive problem for laboratories and companies trying to develop and market useful systems.

Even worse, working with AI broke up workflows. Developers toggled from one technology to another, jumping back and forth between workspaces, and repeatedly switching programming tools to get tasks done.

These problems slowed down the adoption of AI systems, making it hard to integrate them into existing technology such as medical care or automobiles. Once all the elements were working together and launched, it was difficult to provide support when help was needed.

The IBM Watson Studio solution

IBM Watson Studio fulfills the need

IBM's Watson Studio solution is what researchers call an integrated development environment (IDE). Named after IBM's founder, it pulls together the most useful development and analytic tools, wrapping them in a development platform that is powerful enough to meet large-scale challenges, yet simple enough that developers can master it quickly.

IBM Watson Studio solves AI development problems. With IBM Watson Studio, businesses can simplify data projects with a streamlined process to extract insights from data to help them get smarter faster. It delivers an easy-to-use, collaborative data science and machine learning environment to build and train models, prepare and analyze data, and share insights all in one place.

IBM Watson Studio is a single environment for sharing work to solve problems within the system, rather than starting from scratch every time a new issue arises. And developers can use that efficiency to quickly dive into building machine learning and deep learning algorithms.

Watson Studio gives developers:

- A collaborative data science and machine learning environment
- Easy visualizations with drag-and-drop code
- An efficient workflow
- A built-in neural network modeler
- Open-source tools such as Jupyter Notebooks and RStudio

Watson Studio's features sound impressive. But do they really make a difference? Read on to learn how they help developers working on real-world projects.

Typical tools and dashboards

IBM Watson Studio speeds data input and insights output

Watson Studio is more than a collection of resources that can communicate with each other. It eases ingesting data into an AI system, organizes assets, performs complex analysis, and displays results that make complicated issues simpler to understand.

Automated data preparation

IBM Watson Studio has a feature called [AutoAI\(opens in a new tab\)](#) that prepares raw data for machine learning. It can apply various algorithms to clean and structure the data, automatically select an appropriate model, and optimize its output for the fastest, most useful output.

Visual neural network design

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Watson Studio helps developers create machine learning flows and design neural networks visually, using a simple drag-and-drop interface and open source code libraries.

Sophisticated analysis and prediction

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Watson Studio recommends algorithms and uses the latest neural networks to predict and build patterns. It helps programmers create visualizations simply by selecting data items, after which the system itself can choose the best way to visualize its findings.

Unified dashboard displays

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Watson Studio dashboards not only visualize the results of complex analyses, they also gather related views on data into a single place where clients can find and understand the information they seek. These dashboards don't require specialized coding or database skills, and researchers can easily share them across the internet.

Putting Watson Studio models to work

When a classical computer program is not enough

Today businesses, industries, and governments need more computing power than seemed enough just a few years ago. They depend on data analysis that can only be developed from machine learning models, using tools like IBM Watson Studio.

Consider, for example, the problem faced by a sneaker manufacturer that wants to know what customers think and say about its products. This information could help it plan product distribution for today and keep up with new trends in the future. The best way to discover these things might be to study product reviews people have posted, and also study IM texts sent by the manufacturer's teen and young adult customers. What are they saying? What do they love or hate? What new thing did they just see that they really want to buy?

Here are some of the things that make this discovery difficult.

- Millions of social media posts hit the internet every hour across Twitter, TikTok, and others.
- Those posts cover zillions of topics, most of which have nothing to do with sneakers.
- Posts that do mention sneakers might do so in countless different contexts.

Even if a conventional computer could be programmed and given enormous resources to keep up with this flood of data, sneaker fashions change without warning—and those changes cannot be predicted or prepared for with traditional program code.

But with IBM Watson Studio, a modest-size team of specialists could build a machine learning model that will, as time goes by, get better and better at spotting major trends in sneaker design. It could even follow celebrity fashions, then begin predicting new trends more and more effectively.