

WEKA for Auto Manufacturers

A Leap in Scalability, Flexibility, and Performance for Design and Production

Challenges

- Managing the large amount of data needed to train self-driving models
- Running large or resource-intensive simulations to design vehicles faster
- Handling multiple types of data with high-performance for computer vision-aided manufacturing.

Solution

- WEKA delivers a quantum leap in scalability, flexibility, and performance with ease-of-use for data-driven automotive manufacturing processes.

Benefits

- 20X faster GPU-based AI learning model solutions with greater accuracy for rapid time-to-market
- Multiprotocol support: POSIX, NFS, SMB, S3, and CSI access to a single data set to streamline data pipelines
- Petabyte datasets with small and large files require no performance tuning. Seamless movement of data between hot and cold tiers

The Challenge: Managing Large Volumes of Automotive Data

The increasing integration of technology into vehicles and vehicle manufacturing is driving increased efficiency, quality control, and innovation. It also supports the development of electric and autonomous vehicles. However, as technology and in particular, AI plays an ever-increasing role in competitiveness, automotive manufacturers face various challenges managing and using the data that power their technology initiatives.

Managing storage often requires expertise in various technologies, such as file systems, databases, and networking. And, as data sets scale, managing storage becomes more challenging to ensure performance and reliability.

The WEKA® Data Platform addresses these challenges and delivers a leap in scalability, flexibility, performance, and ease-of-use for data-driven automotive manufacturing.

WEKA for Autonomous Vehicles

The WEKA Data Platform plays a critical role in the development and operation of AI-powered autonomous vehicles. These vehicles rely on vast amounts of data to perceive their surroundings, make decisions, and navigate safely. Addressing data-related challenges is essential for the successful development, deployment, and operation of autonomous vehicles. Storing and leveraging the large amounts of data needed to train generative AI models needed for autonomous vehicles can be expensive and time-consuming. During an AI pipeline of operations, including ingestion of data, transformation/cleaning/pre-processing, model development, training, and then recursive validation/backtesting, IO patterns are widely varied. According to reports from Google, Microsoft, and organizations around the world, 70% of model training time is taken up by data staging operations, leaving expensive GPU-farms severely underutilized and delaying model development significantly.

The WEKA Data Platform is a software solution that ensures you can constantly saturate your GPUs doing the self-driving model training by providing the highest throughput at the lowest latency. The more data a deep learning model can consume and learn from, the faster it can converge on a solution, and the greater its accuracy will be. WEKA collapses the typical GPU-starving "multi-hop" AI data pipeline using a single namespace where your entire data set is stored. This zero-copy architecture eliminates the multiple steps needed to stage data before training.

Incorporating the WEKA Data Platform into autonomous driving data pipelines saturates data transfer rates to GPU systems. It eliminates wasteful data copying and transfer times between storage silos to geometrically increase the number of training data sets that can be analyzed per day. The WEKA Data Platform efficiently handles large numbers of files and patented data layout algorithms distribute and

parallelize all metadata and data across the cluster in small 4k chunks, this creates incredibly low latency and high performance whether the IO size is small, large, or a mixture of both.

WEKA for Vehicle Modeling

Aerodynamics in vehicles, including passenger cars, are modeled using computational fluid dynamics (CFD) simulations, wind tunnel testing, and sometimes a combination of both. High-performance computing (HPC) plays a crucial role in these modeling techniques due to the complexity and computational intensity of aerodynamic simulations.

“WE BUILT A GPU FARM THAT NEEDED A HIGH-SPEED DATA PIPELINE TO FEED IT. WE EVALUATED OPEN-SOURCE SOLUTIONS LIKE HDFS AND THE PUBLIC CLOUD. WE CHOSE WEKA FOR ITS ABILITY TO PROVIDE COST-EFFECTIVE, HIGH-BANDWIDTH I/O TO OUR GPUS AND FOR ITS PRODUCT MATURITY, CUSTOMER REFERENCES, AND STELLAR ON-DEMAND SUPPORT.”

**–PAUL LIU, ENGINEERING OPERATIONS LEAD
WeRIDE**

Aerodynamics are essential for passenger cars to improve fuel efficiency, reduce emissions, enhance safety, and optimize overall vehicle performance. As automotive technology continues to evolve, aerodynamic design remains a key factor in achieving the goals of efficiency, sustainability, and consumer satisfaction. And aerodynamics is a critical aspect of motorsports, where even minor improvements in aerodynamic efficiency can lead to significant advantages in speed, handling, and competitive edge.

WEKA powers high-performance computing (HPC) environments running complex aerodynamic simulations and distribute the computational workload efficiently, allowing for faster simulations.

WEKA's failure domains provide the resiliency needed to keep operations running on tight timelines in case of failure. WEKA's leading performance for mixed IO profiles and multi-protocol support also let automotive manufactures consolidate of multiple storage systems onto WEKA, saving on acquisition cost, management complexity, and power and cooling.

WEKA for Vehicle Manufacturing

Computer vision plays a significant role in vehicle manufacturing by enhancing efficiency, quality control, and safety throughout the production process. It enhances the efficiency and accuracy of vehicle manufacturing processes, reduces errors and defects, and ensures the consistent quality of finished vehicles. It contributes to the optimization of production lines, minimizes waste, and helps manufacturers meet stringent quality standards in the automotive industry.

Developing and sustaining computer vision AI systems calls for infrastructure that can handle large amounts of visual data (images, videos, live camera feeds, etc.) and use them with real computing power. WEKA is designed to handle large volumes of data, making it suitable for manufacturing environments where data streams from multiple sources need to be processed and analyzed in real-time. Computer vision pipelines often involve multiple stages, and different stages may require data in different formats or accessed via different protocols. WEKA's broad multi-protocol support enables seamless data exchange between these stages.

Many computer vision applications leverage cloud resources for scalability and storage. WEKA's cloud support simplifies data management tasks by providing cloud-tiering and data migration capabilities. This enables you to move less frequently accessed data to cost-effective cloud storage tiers, optimizing your on-premises storage resources for more critical tasks.

For More Information or to Arrange a Free Trial

Visit us at <https://www.weka.io/get-started> or email us at info@weka.io.



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