Machine Learning / Artificial Intelligence

Data is the New Source Code

Beyond understanding machine learning techniques and algorithms, we are experts at applying the right approach to address your specific needs.

What is Machine Learning?

Machine learning (ML) is an application of artificial intelligence (AI) that allows software applications to become more accurate in predicting outcomes without being explicitly programmed. Machine learning focuses on the development of computer programs that can access data and use it to learn for themselves. It builds algorithms that can receive input data and use statistical analysis to predict an output, while updating outputs as new data becomes available.

Why Work with CTC?

Concurrent Technologies Corporation (CTC) leverages deep knowledge of machine learning and modern engineering and software development design principles to create efficient and effective ML solutions for both the cloud and edge applications. CTC keeps pace with the rapidly changing ML market to understand the implications of emerging research and to evaluate and integrate these tools and capabilities into commercial ML tools or our own COMBINE™ big data microservices architecture platform.

How Can ML Help Your Organization?

ML technologies can solve real-world organizational challenges and significantly improve existing processes in a variety of ways. CTC has researched and developed these ML applications:

- Data exploitation and anticipatory analysis frameworks that combine a wide variety of modalities
- Capabilities in edge-network devices with low memory, size, weight, and power
- Extended capabilities of existing predictive and control software in additive manufacturing and friction stir welding
- AI virtual assistants that provide recommendations and predictions based on the users' needs and requirements within the greater social enterprise
- Advanced feature recognition and extraction operational capabilities that automate production of high-resolution, four-dimensional environments
- Tools for adapting existing live training scenarios for use within virtual training environments

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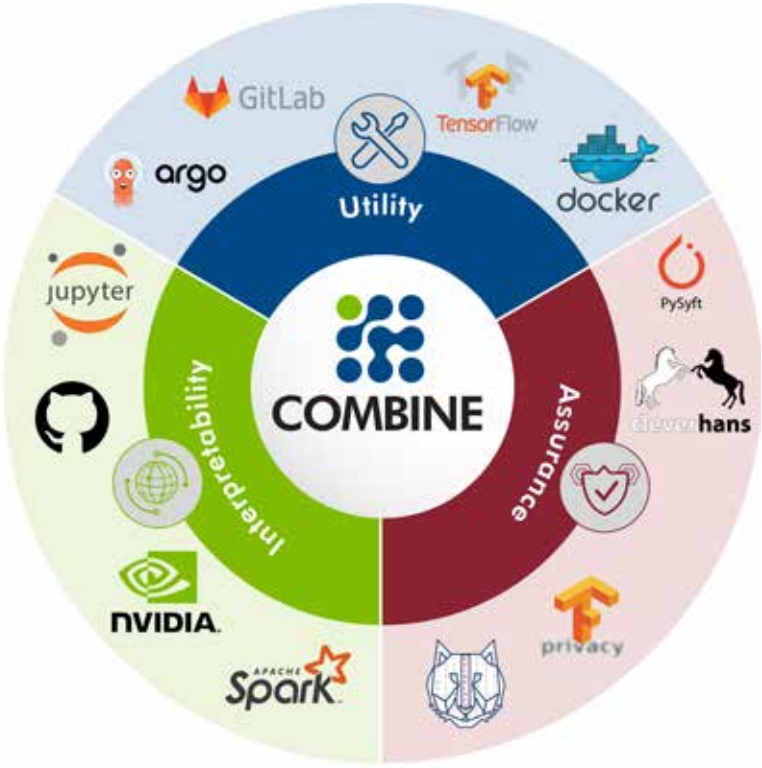
We offer secure and private machine learning models that ensure high utility, assurance, and interpretability.

Utility

At CTC, we understand that ML practitioners desire the highest accuracy model for their deployed applications and that achieving this requires not only analytical expertise, but the ability to rapidly apply deep engineering knowledge of the entire workflow and underlying infrastructure. Our experience performing independent ML research and development has given us unique perspectives and novel ways to build and deploy machine learning models within enterprise or mobile environments. No matter what your requirements are, CTC can integrate new ideas and cutting-edge technologies into your workflow.



Assurance

CTC is performing research and development into the emerging field of ML assurance to better understand the trade-off between model utility and assurance. The ability to create and rapidly deploy highly accurate ML models has become ubiquitous with the high availability of low-cost machine learning as a service (MLaaS) technology, evolving application programmer interfaces to advanced algorithms, and open-sourced and crowd-sourced data. However, ML practitioners should be aware that their models can be vulnerable to privacy and security attacks that can either make them behave in undesirable ways or leak information about their training data sets. CTC is developing mitigation techniques that offer defenses without significantly changing the desired model's accuracy.

Interpretability

CTC has experience finding latent patterns in data using advanced ML techniques. CTC also understands that even if models are 100% technically accurate, they are 100% useless to decision makers if a human cannot comprehend and explain their output. Furthermore, models can be made to have higher utility and better assurance by understanding what data features assist the model in finding those hidden patterns. CTC researches novel techniques to understand model processing and how to contextualize model output with additional information. CTC enables analysts, planners, decision makers, and operators to perform analytics, evaluate circumstances, and understand potential courses of action in a way never before possible.

CTC solves complex machine learning problems with innovative implementations of ML designs in infrastructure.

Research and Development → **Operations and Production**

COMBINE

Interpretability | Utility | Assurance

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COMBINE

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