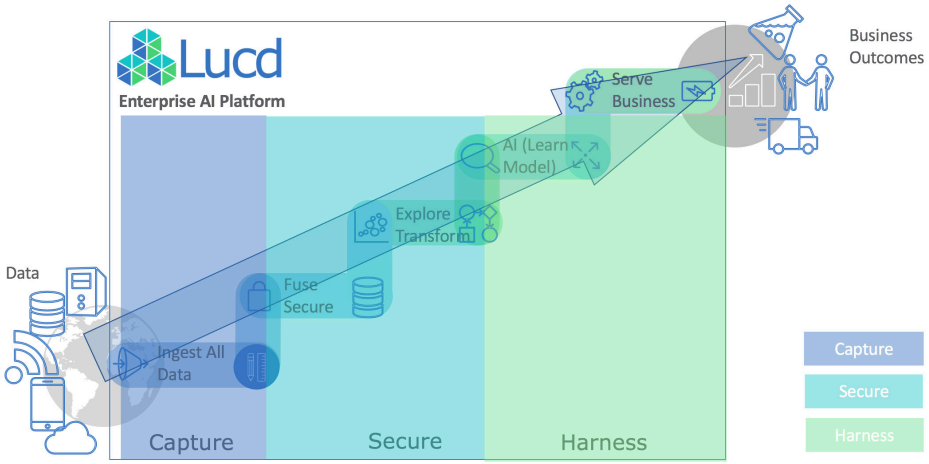
# Patent Pending Technology

## Auto Tuning and Distributed Training

## PATENT PENDING TECHNOLOGY

The market for deep learning is expected to exceed $18B by 2024 [1]. However, EE Times reports that the top two challenges for Deep Learning are first that "once the data sets are in hand, using them to train deep-learning networks can require days on big clusters of CPUs and GPUs". Second: "one of the reasons deep learning works so well is the large number of interconnected neurons, or free parameters, that allow for capturing subtle nuances and variations in data. However, this also means that it is harder to identify hyperparameters, parameters whose values need to be fixed before training. The process is more art than science" [2]. Lucd patent pending technology for Auto Tuning and Distributed Training directly address each of these top deep learning challenges.

## THE LUCD ENTERPRISE AI PLATFORM

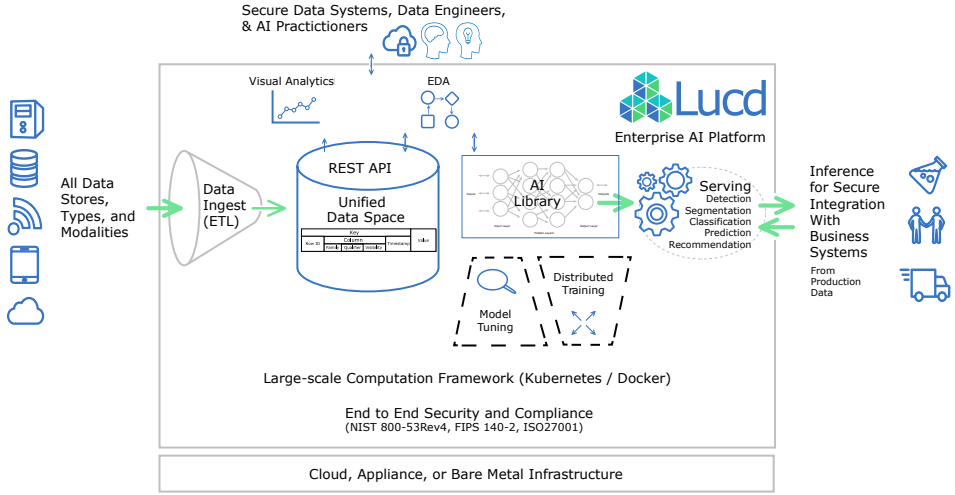



The Lucd Enterprise AI Platform enables businesses to differentiate and develop applications from data powered AI innovation. By Capturing, Securing, and Harnessing data, Enterprises can turn that data in Enterprise AI Outcomes.

## LUCD ARCHITECTURE

The Lucd platform is secure, compliant, and leverages state of the art open source technologies for the complete end to end data/machine learning business pipeline. Where needed, Lucd augments these capabilities with innovative research and development to make Enterprise AI Easy to leverage in learning from data and growing business outcomes.

## MODEL TUNING




As EE Times reports, the benefits of Deep Learning can be missed without tuning of all the parameters needed to make a Deep Neural Network work. Not only are the parameters hard to tune, the search space of all the possible parameter settings is massive. The Lucd team has performed extensive research on capabilities to search large state space and has applied that research to efficient deep learning search and parameter optimization in its patent pending technology. This makes achieving results from Deep Learning faster and easier and allows more businesses the opportunity to leverage Deep Learning.

## DISTRIBUTED TRAINING

The other challenge with Deep Learning is the volume of data and the size of the deep neural networks that are used to get accurate results that can be used in business. The size of the compute infrastructure required to run a deep neural network at scale can become cost prohibitive.

The Lucd team has performed extensive research on capabilities to efficiently operate massively parallel computers on very large data compute challenges. The Lucd team has applied this capability to efficient computing for deep learning in its patent pending technology. This makes running deep neural networks much faster and much less inexpensive and allows very large training jobs to be run more timely and data science iterations to occur faster.

By leveraging this research and development, Lucd allows more and more businesses to turn data into Enterprise AI outcomes.