



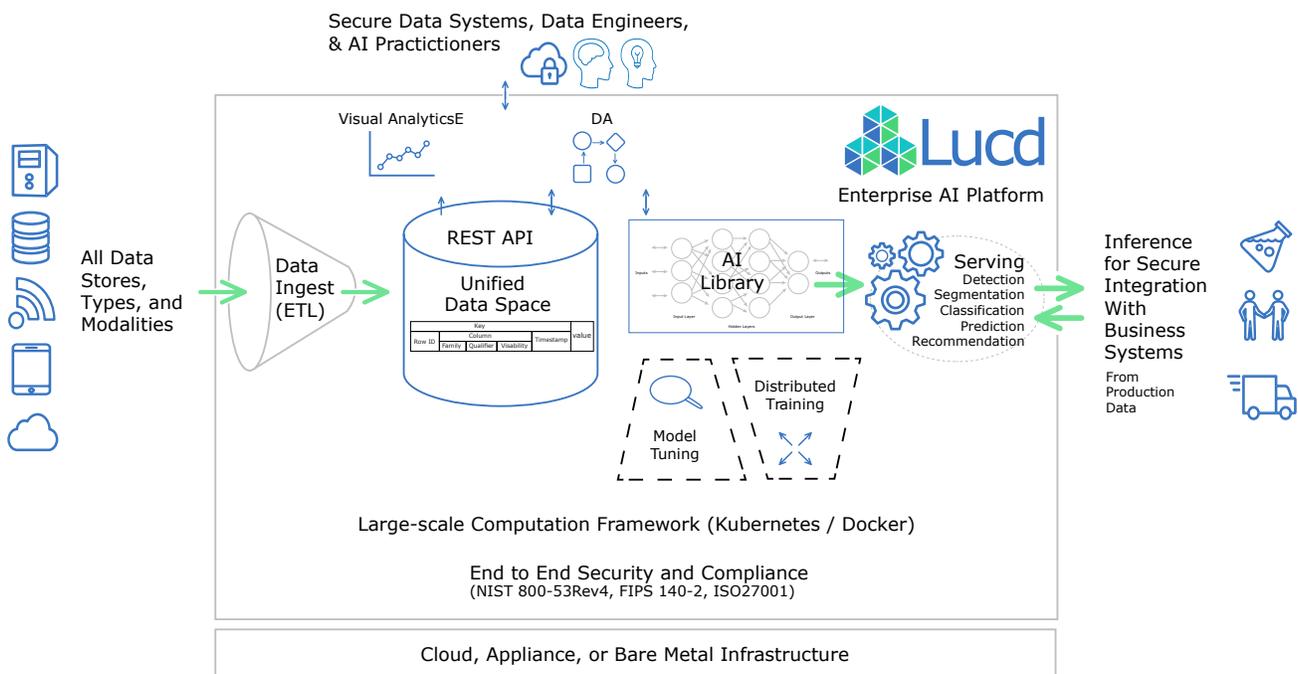
# The Platform for AI Innovation

## Driving Enterprise AI Success

### UNIVERSAL SEARCH FRAMEWORK

The USF provides automatic AI model selection and tuning of AI models that improved accuracy of the AI data models and speed or reaching required model accuracies. The USF provides: efficiency, robustness to function evaluation noises, scalability dimensional problems, and exceptional handling negligible parameters that lead to more robust and accurate data models which provide the highest quality AI outputs.

### PRODUCT ARCHITECTURE



### AI MODEL SELECTION, ARCHITECTURE, AND HYPER-PARAMETER SELECTION AND OPTIMIZATION IS A CHALLENGE TO EFFICIENT ACCURATE DATA MODELS

Businesses do not have time and cannot afford "grad student descent", a term Ryan Adams from Harvard University coined. "He talked about a 'meta-problem' of machine learning: Most machine learning algorithms are sufficiently complex to give great results – if they are run with parameters that are adapted to the problem at hand. For example, to work with a neural network you have to choose the number of layers, the weight regularization, the layer size, which non-linearity, the batch size, the learning rate schedule, the stopping conditions... How do people choose these parameters? Mostly with ad hoc, black magic methods. One method, common in academia, is 'grad student descent' (a pun on gradient descent), in which a graduate student fiddles around with the parameters until it works." [Link](#)

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### **BUSINESS CONSTRAINTS REQUIRE "NEURAL ARCHITECTURE SEARCH"**

With constraints on speed to reaching a business valuable model and with varying degrees of accuracy required for different business challenges, as well as constrained skillsets to "tune" models, Businesses need automatic selection and tuning of AI models. This is called "Neural Architecture Search".

### **LUCD USF PROVIDES INDUSTRY LEADING NEURAL ARCHITECTURE SEARCH**

The Lucd USF provides efficient and automatic model selection and hyperparameter tuning allowing businesses to rapidly arrive at models needed and model accuracies needed to achieve business value. The Lucd USF uses unique Intellectual Property for leading Neural Architecture Search results in the AI Industry. USF has proven far superior to not only "grad student descent" but to other grid search and genetic algorithms that are in use today.

**The Lucd USF provides the Neural Architecture Search capability that Businesses need for AI Innovation.**

#### **Details:**

The Lucd USF is tightly integrated with the Lucd AI Library so that models and tuning parameters can rapidly be searched and results fed back into the AI library for use in accurate deployed models. The USF capability will be included in LucdaaS in 2Q2018.

