

VERTEX
LABORATORIES

CAPABILITIES



EXPERTISE

Machine Learning

A type of mathematical algorithm that enables systems to learn from data and predict the outcomes of key business metrics whose connection to the data is not readily apparent from traditional statistical techniques or human analysis. Furthermore, these algorithms can be used to make optimal decisions from the resulting system.

Automation

Using machines and/or software to perform tasks currently done by humans so that the results are more consistent, cost effective, and scalable. Often the automation techniques involve heavy use of machine learning, deep learning, data scraping, and customized techniques. These tasks can range from things as simple as automatically filling out spreadsheets from web data or replacing data entry to complex tasks such as operating industrial machinery and self-driving cars.

Deep Learning

A modern variant of machine learning that trades human readability for performance. It is well suited for big data and creating disruptive technologies (e.g. image recognition, movie recommendation, seizure prediction, automated medical diagnostics).

Data Science

The practice of using scientific, statistical, and machine learning methods to generate insight from data. The end result is often in the form of graphs and reports to help inform of business decisions and effects on ROI.



CLIENT PROFILE

Our clients operate in heavily data oriented industries and rely on the accuracy and understanding of data to remain competitive and achieve success. Clients typically fall into two categories: they have existing data, but are unable to achieve the results and insights desired or they are entirely lacking the data infrastructure needed to achieve their objectives. In most cases, clients with data either have the wrong data or lack the technology to automate and optimize their existing pipelines. Alternatively, the clients lacking data are in need of proper infrastructure in order to establish efficient data pipelines. In both cases clients are seeking to increase efficiency, lower cost, and improve productivity.

Our clients recognize how critical it is to utilize cutting edge technology and techniques in order to remain competitive and successful in their respective spaces. It can be extremely time-consuming and expensive for companies to obtain access to the talent and technology needed to internally develop and optimize data pipelines. Instead of recruiting, hiring, and training in-house data science teams, companies rely on Vertex Labs as their one-stop shop for advanced technology needs.

Our solutions are industry agnostic, which allows us to create value for clients of all shapes and sizes in various industries. We leverage our network of experts in order to ensure we have specialists accompanying each project manager during the entire duration of each project. This process guarantees that our solutions properly fit the specifications of each client's needs. The solutions we design and deploy focus on increasing efficiency, lowering cost, and optimizing existing pipelines in order for our clients to achieve their strategic, tactical, and technological goals.

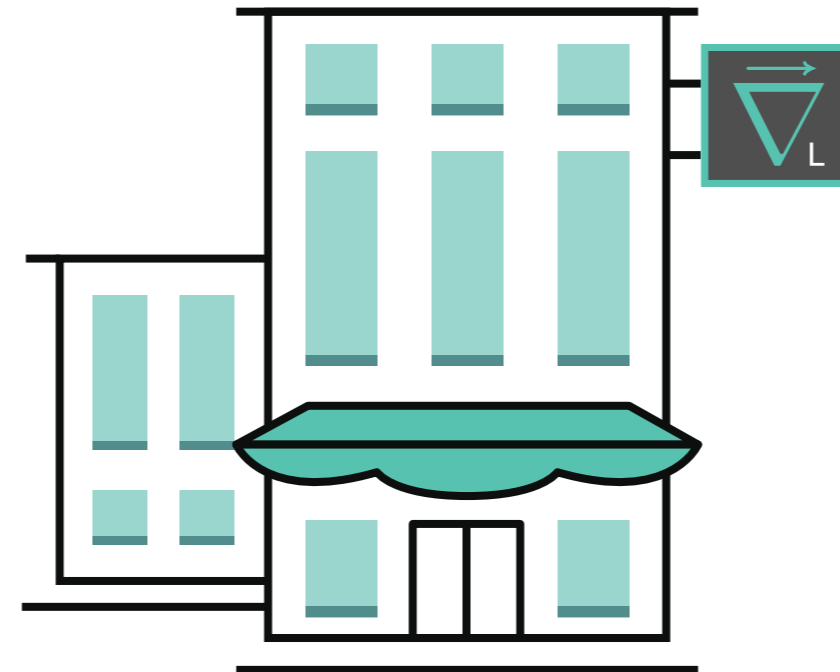
Vertex creates value for companies looking to:

- ▼ OPTIMIZE
- ▼ PERSONALIZE
- ▼ AUTOMATE
- ▼ PREDICT
- ▼ MAINTAIN



SOLUTIONS - CONSULTING

For clients with significantly large or niche data science needs, we provide both temporary and on-going consulting services. The extent and duration of our consulting varies depending on the scope of the project, as no two projects are the same. Whether a client needs to begin with data collection, or has existing data but needs advanced technology or techniques, we work side-by-side to design and develop solutions from the ground up to fit their unique situation. We understand that complex problems require time and attention to detail, which is why we strive to provide clients with custom models that deliver efficient and effective results.



Our clients are able to realize the benefits of having a dedicated in-house data science team without incurring the costly overhead required to staff, train and maintain an in-house team. The utilization of our expertise and strategic partnerships with industry leaders, allows our clients to significantly save time and reduce cost when deploying their pipelines. Whether developing software or providing critical support, our team provides a one-stop shop for data science and advanced technology needs for projects of any size or duration.



SOLUTIONS - LICENSING

We understand time is of the essence, which is why we provide licensing to clients in need of immediate solutions. We license and adapt our existing algorithms, platforms, applications, and plug-and-play data science tools. These solutions have a broad applicability and are available for immediate deployment. The licensing of our intellectual property is a perfect fit for clients seeking to add advanced features to existing products or realize long term benefits from innovation. This approach also allows us to expedite the process of implementing and deploying advanced technology. Licensing terms vary depending on the circumstances and client's needs. However, we ensure a tailored solution that will provide the most value for each of our client's specific needs.



Our licensed solutions and plug-and-play models are an ideal and affordable fit for clients who do not have the luxury of using time-intensive solutions. Clients benefit from the quick turnaround time and seamless integration of advanced technology, without spending the time and money to develop in-house. These immediate solutions are adaptable and help improve existing products and processes. Licensing is optimal for clients with existing data and robust data infrastructure, seeking long term solutions.



SOLUTIONS - CLOUD SERVICES

As a result of our corporate sponsors and partnerships, we are able to provide our clients with cloud computing services at an affordable price. These cloud-based services provide scalability and efficiency for structuring and storing of data of any size. We manage the entire process of analyzing the existing data and storage, determining the best fit, and the migration process. The seamless transition from old storage to new is crucial in ensuring there is no data lost or corrupted.

Our cloud services support enables companies to optimize their pipelines whether they have small or large amounts of data. Clients benefit from increases in efficiency, security, and accuracy while lowering the costs associated. These services also minimize the need for advanced compute power. Additionally, these services provide companies with outdated data storage the opportunity to upgrade to more robust and scalable systems.





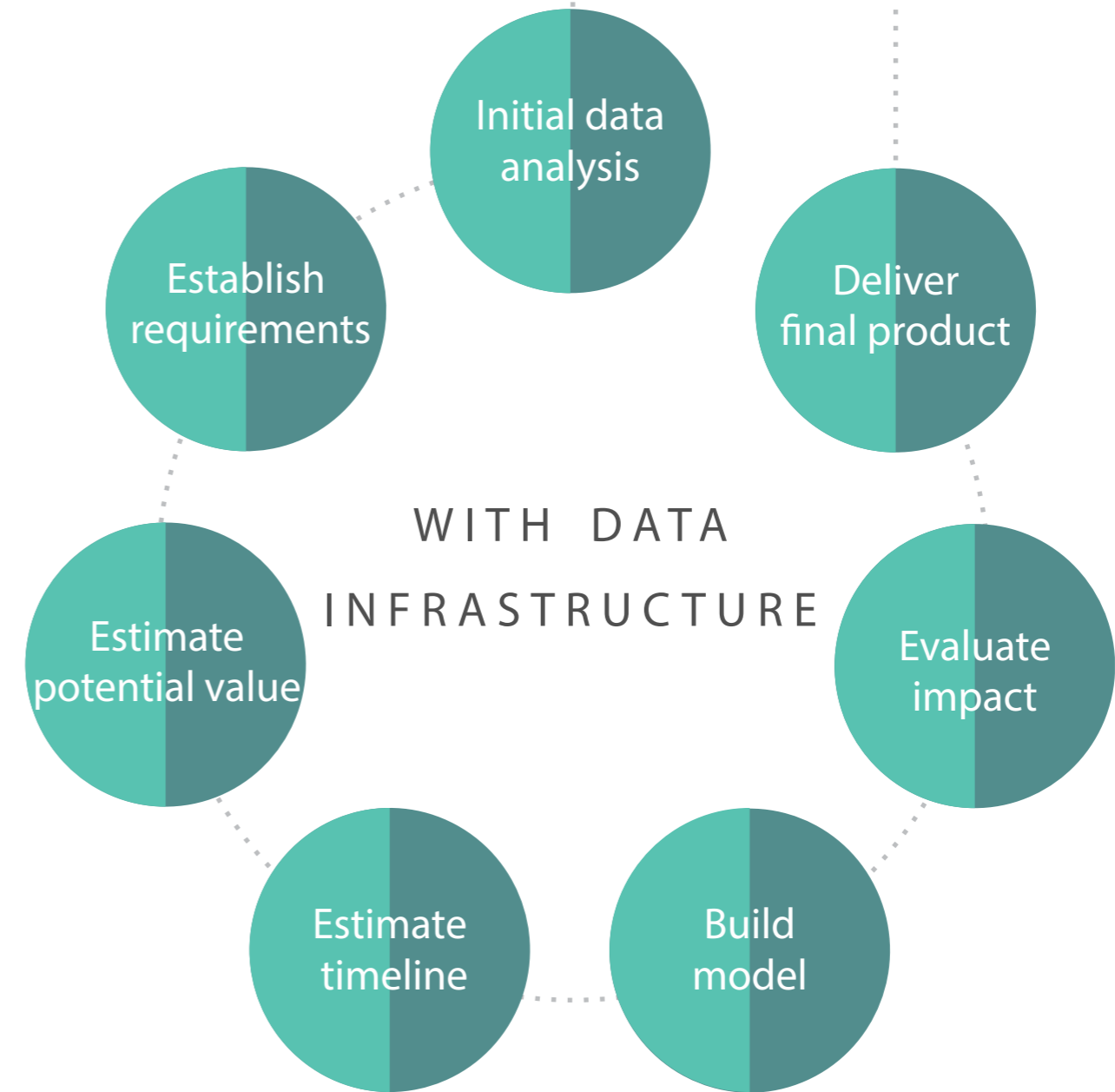
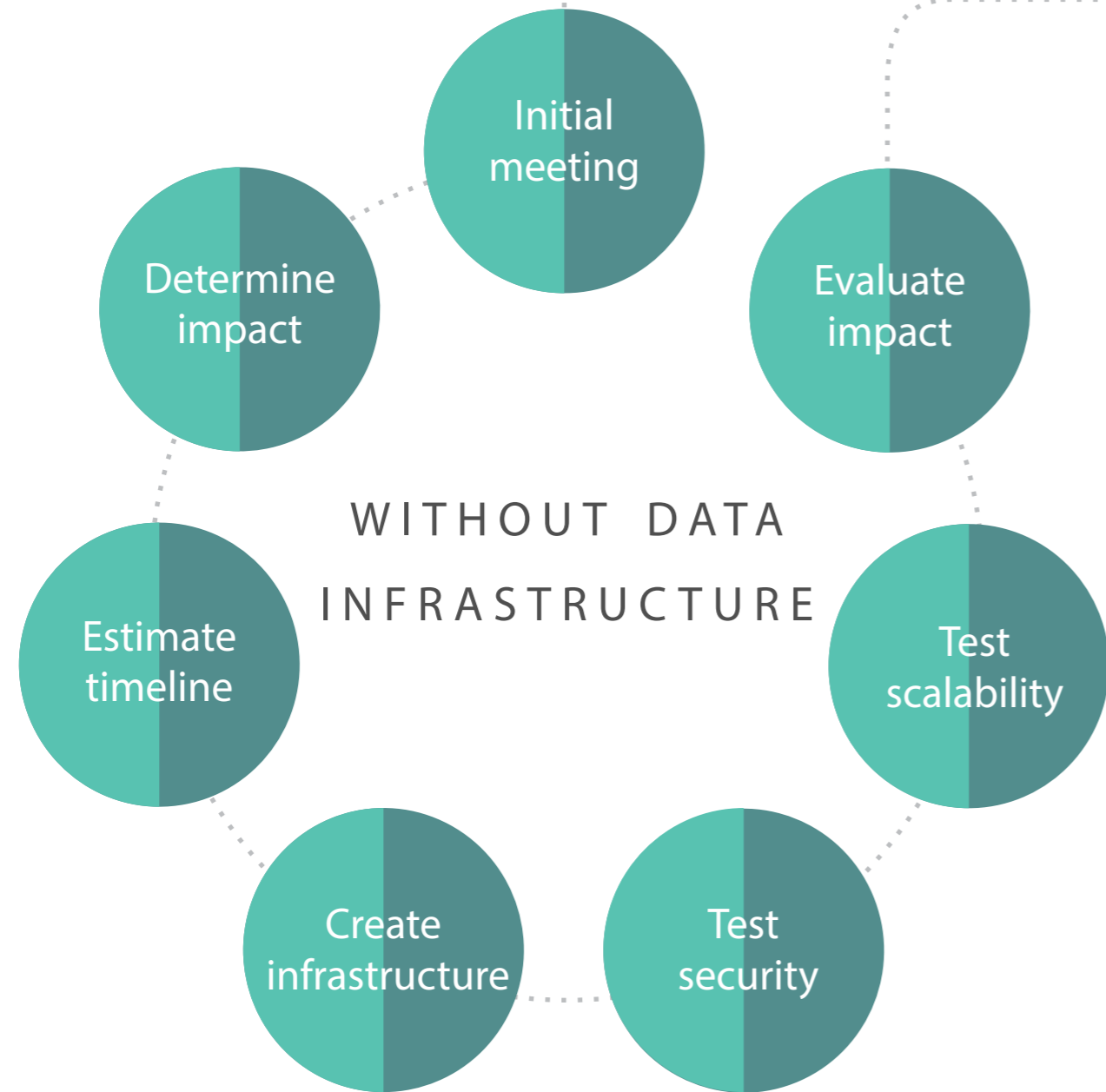
SOLUTIONS - INTERNAL PRODUCTS

Our Research and Development team is constantly working to identify gaps in the market that would benefit from our expertise. We work diligently to develop data driven solutions with broad applications to solve these industry wide problems. Our sales and marketing team distribute these products to clients in need of fully developed front facing solutions. These products are capable of independent use as well as third party integrations.

Our internal products and stand alone platforms are an ideal fit for clients operating in industries where several companies are seeking similar solutions to a common problem. These industry wide solutions allow for scalable infrastructure, which cuts costs and increases productivity. Benefits from our internal products are most commonly realized by small business clients, who are unable to design and deploy advanced platforms and automation systems in-house due to lack of resources.



OUR PROCESS





INDUSTRY - PHARMA

Current Challenge:

Pharmaceutical companies are currently spending an exorbitant amount of time and money on research and development for new drug discovery. The process involves a large amount of waste due to the brute force method of testing. The reagents required to run experiments is expensive and the data generated from these experiments is difficult to interpret and accurately assess.

How we solve it:

- ▼ DATA VIS.
- ▼ DATA WAREHOUSING
- ▼ NLP
- ▼ DEEP LEARNING
- ▼ AUTOMATION
- ▼ MACHINE LEARNING

Outcome / Value:

The solutions we deploy allow for an efficient method for decision making with less material. The ability to automate certain tasks helps to eliminate human error, while allowing for a more useful allocation of time and resources. Data visualization provides easier outcome assessment, testing efficiency, and an overall increase in the speed of reaching the market.



INDUSTRY - BUSINESS INTELLIGENCE

Current Challenge:

Many organizations are using outdated analytics methods to understand internal and external driving forces. The lack of accurate information leads to decision making which could negatively affect the financial and competitive standing of the organization. Companies often use legacy software which hinders their capabilities, or they have limited access to the advanced methods needed collect, organize and understand important data for growth.

How we solve it:

- ▼ CLOUD SERVICES
- ▼ SIGNIFICANCE TESTING
- ▼ DEEP LEARNING
- ▼ STATISTICAL ANALYSIS
- ▼ MACHINE LEARNING
- ▼ DETERMINISTIC MODELING

Outcome / Value:

The solutions we provide allow our clients to realize their full potential through the use of data driven decisions. Our clients have the ability to utilize the most advanced analytics tools to improve their understanding of market data as well as their internal data. This enables them to improve their bottom line and choose optimal courses of action in order effectively compete and grow.



INDUSTRY - SECURITY / DEFENSE

Current Challenge:

The ability to monitor and accurately detect security breaches is paramount when handling sensitive data. Companies in this space are challenged by high-costs, high risk of failure, and limited manpower. Breaches in security impact businesses as well as their customers. This results in losses of trade secrets, finances and personal privacy. This data is difficult to store and monitor because of its large size and continued exponential growth. In addition to cyber security, local security currently lacks the ability to effectively predict and prevent crime.

How we solve it:

- ▼ IMAGE REC.
- ▼ VIDEO REC.
- ▼ SPEECH REC.
- ▼ NLP
- ▼ ANAMOLY DETECTION
- ▼ PREDICTIVE ANALYTICS
- ▼ AUTOMATION
- ▼ FLEET LEARNING

Outcome / Value:

Our solutions allow for quicker detection and prevention of data breaches. We provide predictive analytics to ensure that past breaches do not occur again while preventing future breaches. Automating the monitoring and analyzing of security system's data significantly lowers the time and labor needed. Our clients are able to improve their bottom line while achieving higher accuracy of threat detection. This results in saving the organization and their customers money while protecting the loss of personal information.



INDUSTRY - E-COMMERCE / RETAIL

Current Challenge:

Companies operating in retail and e-commerce currently struggle with managing inventory, detecting fraud, personalizing user experience on the web, and increasing sales conversions online and in store. This affects companies' potential to generate sales while improving user's overall experience and ability to find the products they are seeking. Companies are unable to effectively understand their data in order to make the best decisions when managing profit margins, spotting trends, managing employees, sourcing inventory, and growing sales.

How we solve it:

- ▼ NLP
- ▼ CHAT BOTS
- ▼ CLUSTERING
- ▼ WEB-CRAWLING
- ▼ WEB-SCRAPING
- ▼ DEEP LEARNING
- ▼ DATA VISION
- ▼ MACHINE LEARNING
- ▼ CLOUD COMPUTING
- ▼ DATA WAREHOUSING
- ▼ ANOMALY DETECTION
- ▼ UNSUPERVISED LEARNING

Outcome / Value:

Our solutions provide the tools needed to optimize inventory and employee management while providing the most important analytics for sales, sourcing, fraud detection, and customer segmentation. This allows companies to lower costs, while targeting and reaching new customers. The ability to personalize e-commerce sites and applications provides higher sales conversions as well as a superior overall experience for users. Customer service costs are lowered through the use of chat bots to automate the process. With our help, companies are able to effectively use their data to make important financial and growth decisions which determine the success of their business.



INDUSTRY - MARKETING

Current Challenge:

Marketers and advertisers rely heavily on accurate information in order to effectively reach their target audience and convey the proper messages. Unfortunately it can be difficult to analyze market data and generate useful insights. The need for personalized information and hyper-targeting is becoming increasingly more apparent. In order to market in an efficient and cost effective manner, it is important to collect and analyze market data, understand customer segmentation, and accurately target audiences. Additionally, the production of content is time consuming and costly due to the licensing fees and costs of creative staff.

How we solve it:

- ▼ CHAT BOTS
- ▼ MACHINE LEARNING
- ▼ GANS
- ▼ DEEP LEARNING
- ▼ REC. SYSTEMS

Outcome / Value:

Vertex provides the technology necessary for marketers to prove and improve the value of their efforts. Our methods provide a more accurate collection and understanding of market data in order to successfully target and segment audiences. We provide a better understanding of existing market data, while introducing new techniques for market discovery, targeting, and measuring the success of existing campaigns. Making data driven decisions lowers cost and time requirements while increasing the rate of success with new campaign deployment. Additionally, the automation of content creation through the use of Generative Adversarial Networks (GANS), provides a rapid decrease in time and cost needed within the creative department of agencies.



INDUSTRY - FINANCE

Current Challenge:

The massive amount of data being generated each day is simply too large and overwhelming to be accurately and effectively analyzed by human analysts. The manpower needed to maintain a handle on this large amount of data is both time consuming and costly. The detection of anomalies, trends, and opportunities is often missed and thus the ability to capitalize on these is also missed. This presents a great deal of uncertainty when firms are making financial decisions, which affect global markets and individual's wealth. Firms often experience financial and competitive losses because of these uncertainties and missed opportunities.

How we solve it:

- ▼ NLP
- ▼ CLUSTERING
- ▼ DEEP LEARNING
- ▼ PREDICTIVE MODELING
- ▼ MACHINE LEARNING
- ▼ ANOMALY PREDICTION

Outcome / Value:

The solutions we create for financial clients allows them to better analyze and understand financial market and economic data. This leads to better decision making when trading and investing. Additionally, the ability to properly analyze millions of data points and detect trends and make predictions allows for an increase in return on investment for their clients. The automation of data analysis and trading processes enables companies to improve their bottom line by lowering costs and increasing revenue due to better investment decisions.





INDUSTRY - MEDICINE

Current Challenge:

Doctor's time is limited and expensive, which is why it is important to have a complete understanding of health and medical data during the evaluation and diagnosing phases. There is an overwhelmingly large amount of sensitive and crucial data, yet no centralized database. The processes for collecting, storing and maintaining data differs between doctors offices and hospitals, which makes it difficult and inefficient when sharing. This lack of centralization leads to high administrative costs and incorrect documentation, which affects the accuracy and ability to diagnose patients and make early predictions of diseases.

How we solve it:

- ▼ NLP
- ▼ MACHINE LEARNING
- ▼ AUTOMATION
- ▼ DATA WAREHOUSING
- ▼ DEEP LEARNING

Outcome / Value:

Our models provide a streamlined process for collecting, storing, maintaining, and analyzing medical records and health data. Once this platform is in place, medical staff have the capability of easily searching the analytics and insights needed to make crucial life saving decisions. Additionally, our approach enables automated disease diagnosis and diagnostics. This saves doctors time, lowers costs, increases accuracy, and leads to more lives saved.



RECENT EXAMPLES

Orai

- ▼ Developed custom voice activation detection algorithms
- ▼ Modeled filler word detection with raw audio signals of natural speech
- ▼ Provided custom image recognition solutions for smile intensity detection

Seizure Prediction

- ▼ Designed and trained deep learning algorithm to better predict seizures faster and with higher accuracy
- ▼ Increased prediction accuracy by 60% with no false positives
- ▼ 3 times faster prediction time, leading to more lives saved

Project One

- ▼ Uses article intelligence to level the playing field of undergraduate education
- ▼ Algorithms adapt to students, realizing patterns in their learning habits similar to a real-life teacher might
- ▼ Enables students to identify areas of improvement when learning

ISOLET

- ▼ Speech dataset containing spoken letters
- ▼ Currently hold the world record
- ▼ Achieved 98% accuracy

Point of Sale

- ▼ Designed machine learning model for inventory and employee management.
- ▼ Provided insights for data driven decision making with purchase orders, profit margins, and CRM
- ▼ Integrated inventory and sales reporting into cloud with offline and ecommerce capabilities

Blinc

- ▼ Designed machine learning algorithm to provide hyper-targeting to local merchants
- ▼ Implemented deep learning models to analyze and provide actionable insights on market data
- ▼ Used recommender systems to better position merchant offers to the most interested users



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