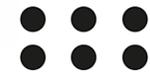




DATHARSIS
DATA SPEAKS, WE INTERPRET



COMPLEX DATA ANALYSIS

Transforming complex data into efficient
and personalized solutions



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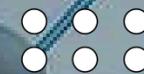


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01

PRESENTATION

The generation of data is growing exponentially. However, the ability to integrate, clean, and rigorously interpret this information remains limited.

This deficit has **critical consequences** in various sectors.



Insufficient data for crucial decisions



Multiple data sources (records, images, logs) are difficult to integrate



Poor data analysis practices lead to miscalculated results



Highly dimensional datasets with multiple factors, interdependencies, missing values, outliers, and complex relationships



Vast amounts of heterogeneous information with **difficult-to-determine effects** and a **lack of clear insights**



In this context, Datharsis positions itself as a strategic ally, combining state-of-the-art **statistics** and **data science**, supported by cutting-edge international research, **to convert complex data into reliable, reproducible evidence with real impact** on business and innovation.

VALUE PROPOSITION

02

We turn complex data into solid evidence so that companies and researchers can make better decisions.

Our difference is based on three fundamental pillars:



INTERPRETATION AND CAUSALITY

We don't just tell you "what is happening," but we explain "why." This generates solid conclusions that can be applied directly to improve results and optimize processes.



SCIENTIFIC RIGOR + INNOVATION

We combine the rigor of statistics with cutting-edge data science techniques. This allows us to generate reliable and scalable explanatory and predictive models, guaranteeing the validity of each analysis.



TOTAL SCALABILITY

We work with a wide variety of data and cohorts of any size. We use optimized techniques to extract the maximum amount of information, which allows us to minimize the risk of publication rejection, accelerate R&D, and improve accuracy.

Many Artificial Intelligence solutions are based on massive and generic data, offering conclusions without explaining the "why". At Datharsis, **transparency** is our promise. We turn your own data into a **competitive advantage**, giving you findings with **strategic value**, supported by a methodology that allows you to understand the reason behind each result, **without the need to resort to artificial data.**



03

TYPES OF DATA

At Datharsis, we understand that each project is unique, and the first step to success is understanding the available data.

We work with a wide range of information, and we are experts in **data fusion**. We combine multiple types of data to create a holistic and causal vision.

The types of data we work with include:

High-dimensional data

Datasets with an exceptionally high number of variables, even when the number of observations is limited



Our expertise lies in identifying the most relevant variables and extracting meaningful insights from complexity

Integration of multiple sources

Information originating from various platforms and with different formats (structured, unstructured and semi-structured)



We are experts in harmonizing these disparate sources to generate a single, coherent analytical framework

Time-Series data

Sequential data points recorded over time



Critical for understanding trends, forecasting future behavior, and identifying patterns.

AREAS OF APPLICATION

At Datharsis, we offer solutions that combine **advanced statistics and data science with your experience**. Our goal is to transform heterogeneous datasets into **applicable and reproducible evidence** that supports strategic decision-making, innovation, and business optimization across all sectors.



TRANSDISCIPLINARY APPLICATIONS OF MOLECULAR BIOLOGY

Integration of omics data for advances in healthcare, ecology, and other fields



CYBERSECURITY AND COMMUNICATION NETWORKS

Advanced detection and diagnosis of attacks or system failures, planning and optimization of networks and services



INDUSTRIAL PROCESSES (INDUSTRY 4.0)

Process and quality improvement for efficient production



CHEMICAL ANALYSIS

Compound identification, food traceability/authenticity, optimization of mixtures



CLIMATE CHANGE AND PALEOCLIMATE

Data analysis to understand historical and current climate patterns



VOLCANIC AND SEISMIC ACTIVITY

Monitoring and modeling of geophysical data for natural event prediction



URBAN MOBILITY MODELS (SMART CITIES)

Traffic optimization and urban planning based on mobility data



OTHER SECTORS

Given the universal nature of data, our analysis methodology is applicable to any field. We are prepared to adapt our solutions to generate value and results that drive your business or research

05

SCOPE OF SERVICES

At Datharsis, **we accompany you throughout the entire data lifecycle**, from experimental design, even before its generation, to its analysis, interpretation, and the delivery of results. This comprehensive approach allows us to guarantee rigor, precision, and quality in each phase, adapting to your specific needs.



	PHASE	WHAT WE DO	WHAT YOU GET
1	Experimental design	Definition of key questions and sample size	Robust initial trials, with less risk of rejection and better use of resources
2	Data curation	Multi-source cleaning and integration	Reliable datasets, ready for analysis, and free from biases
3	Exploratory analysis	Visualization and descriptive statistics	Rapid understanding of patterns and anomalies, which guides advanced analysis
4	Inference and causality	Univariate and multivariate models	Solid and defensible conclusions
5	Machine Learning and interpretable AI	Predictive models and classification	Precise and transparent predictions, avoiding "black box"
6	Delivery and publication	Reports and writing support	Clear and publishable results that reinforce credibility and accelerate funding

1

Experimental design

Strategic Data Collection

Laying the foundation for success

Before starting any analysis, it is essential to **ensure that the data collection process is optimal**. An inadequate data collection plan can compromise the integrity of the results, leading to flawed conclusions and wasted resources.

Our objective is to ensure that your data collection strategy is efficient, rigorous, and aligned with your business or research objectives, providing a solid foundation for any subsequent analysis



We work together with you to:

-  **Define project objectives and scope:** Clearly establish what you want to achieve and what questions you need to answer.
-  **Establish appropriate methodologies:** Select the best design for your study or data collection process to minimize bias and maximize the relevance and interpretability of the results.
-  **Identify variables and metrics:** Define the key variables to be measured and the necessary metrics to answer your questions.
-  **Design a robust sampling strategy:** Ensure that your data is representative and that the sample size is sufficient to obtain statistically significant and reproducible results.

Data cleaning and curation

The foundation of a reliable analysis

2

Data curation

Once the data has been collected, cleaning and curation are crucial to **ensuring the quality and validity of the results**. Without a solid database, any subsequent analysis could lead to erroneous conclusions.

-  **Data cleaning:** We are responsible for detecting and correcting errors, missing values, and duplicates, which are common in various sector data.
-  **Format standardization:** We synchronize data from various sources to ensure they are consistent and compatible, facilitating their integration and analysis.
-  **Data quality validation:** We verify the integrity and reliability of the information, giving you the peace of mind that your analysis is based on rigorous and high-quality data.



3

Exploratory
analysis

Exploratory Data Analysis (EDA)

The first step toward knowledge

EDA is the initial phase where **we discover the secrets hidden** in your data. It is a visual and statistical exploration that allows us to understand the structure, identify patterns, and detect anomalies before applying more complex analyses.



-  **Data visualization:** We create personalized charts and tables that allow you to see and understand trends, relationships, and patterns intuitively.
-  **Descriptive statistical analysis:** We summarize the main characteristics of your data, such as the mean, median, or standard deviation, to get a clear and concise overview.
-  **Identification of relationships between variables:** We look for the interconnections between variables to understand how your data behaves. This serves as a roadmap for subsequent advanced analysis.

SCOPE OF SERVICES

Statistical Inference The "why" behind the data

4

Inference and
causality

 **Hypothesis testing: univariate and multivariate:** This is the pillar of a reliable data analysis. We help you validate key findings and reduce the risk of erroneous conclusions.

 **Univariate inference:** We use techniques like ANOVA based on permutation tests and with corrections like FDR and Q-value to compare groups and detect significant differences. This more traditional analysis is complementary to multivariate analysis..

 **Multivariate inference:** It maximizes statistical power and allows for understanding complex relationships. We primarily use our experience in vASCA, our own technique with excellent statistical power and interpretability

 **Key visualization and interpretation techniques:** We provide you with clear results and intuitive graphics so you can interpret the findings. We rely on tools such as Manhattan Plot, Volcano Plot, and multivariate graphics.

Our specialty is going beyond correlation to establish **cause-and-effect relationships**. We provide you with solid conclusions that are applicable to your project through detailed inference adapted to the complexity of your data.



We also offer other types of analysis, such as **linear regression** models to predict variables of interest, and **survival analysis** for studies that investigate the time to an event, such as disease recurrence.

5

**Machine Learning
and interpretable AI**

An accurate and reliable AI Decisions based on understanding

As an additional service, we can implement **Machine Learning and interpretable AI** models to complement your analyses. These models help you make safe decisions based on the data, since they not only give you a prediction but also explain the "why" behind each result so you can understand and trust the conclusions.



Prediction: Creation of models to predict the response to treatments or equipment failures.



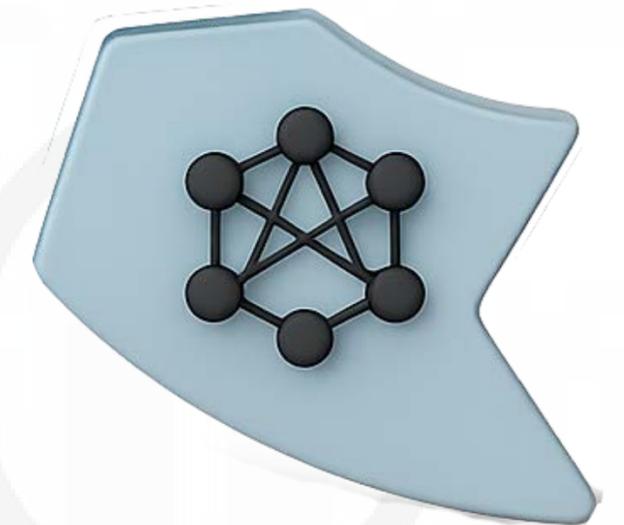
Anomaly detection: Identification of unexpected patterns or atypical data points for in-depth analysis.



Classification: Creation of models that allow you to automatically categorize and organize your data.



Optimization: Improvement of processes and operational efficiency based on data.



SCOPE OF SERVICES

Delivery of results and publication support

6

**Delivery and
publication**

We deliver a document with an executive summary, the key findings of the analysis, and personalized visualizations for a total understanding

In case you need it, we help you prepare the statistical analysis section in the materials and methods section of the proposal, create charts and result tables, and argue the methodological decisions based on scientific literature

We ensure that each project culminates in a clear and effective communication of the findings. We offer these services to complement the analysis or to help you in the final phase of your project.



We meet with you to present the report, explain the results, and resolve any questions you may have

If you need additional analysis to respond to revisions, we offer a package of hours for corrections and adjustments



FLOWCHART

We have designed a clear, transparent, and results-oriented consultancy process. This guarantees that at each stage you know what to expect and what value you will obtain.



1 Initial interview: We meet to understand your needs, objectives, and the context of your project

2 Project analysis and definition: We prepare a report with an analysis proposal and define the key questions

3 Proof of concept and data request: If necessary, we validate our approach with a small analysis and request the necessary data

4 Analysis execution: We perform the advanced analysis of your data

5 Report drafting and presentation: We prepare a scientific-technical report and present the results to you and resolve all your doubts

6 Revisions and post-delivery advice: We accompany the revision phase with additional analysis and expert advice when you need it



07

NEXT STEPS

In business or research, time and data quality are decisive. Every month lost in inefficient analysis or shaky conclusions delays innovation and increases costs.

Therefore, if you are looking for a partner that combines **data science, advanced statistics, and experience**, let's talk now..

Let's transform the future together

CONTACT US



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