

Data Science

- Direct SERS profiling of small extracellular vesicles in cerebrospinal fluid for pediatric medulloblastoma detection and treatment monitoring
- Clinical outcome and deep learning imaging characteristics of patients treated by radio-chemotherapy for a "molecular" glioblastoma
- Independent histological validation of MR-derived radio-pathomic maps of tumor cell density using image-guided biopsies in human brain tumors
- Risk factors for the development of hydrocephalus in traumatic brain injury: a systematic review and meta-analysis
- Long-term outcomes of corpus callosotomy in adult patients with drug-resistant epilepsy: Results from a single neurosurgical center in Mexico
- Automatic detection of hippocampal sclerosis in patients with epilepsy
- Clinical outcomes following stereotactic radiosurgery for brain metastases from sarcoma primaries: An international multicenter analysis
- Classification of glioma grade and Ki-67 level prediction in MRI data: A SHAP-driven interpretation

Data science is an interdisciplinary field that combines scientific methods, processes, algorithms, and systems to extract knowledge and insights from structured data and unstructured data. It involves the application of statistical analysis, machine learning, data visualization, and other techniques to understand and solve complex problems.

The process of data science typically involves several steps:

Data collection: Gathering relevant data from various sources, such as databases, sensors, or APIs. This can involve structured data (e.g., spreadsheets, databases) as well as unstructured data (e.g., text, images, videos).

Data preprocessing: Cleaning and transforming the data to ensure it is accurate, consistent, and suitable for analysis. This includes handling missing values, dealing with outliers, and performing data normalization or feature engineering.

Exploratory data analysis: Conducting an initial exploration of the data to gain insights, identify patterns, and understand the relationships between variables. This may involve statistical analysis, data visualization, and summary statistics.

Model building and machine learning: Developing models and applying machine learning algorithms to the data to make predictions, classifications, or other types of analysis. This can include techniques such as regression, classification, clustering, and deep learning.

Model evaluation and validation: Assessing the performance of the models using appropriate evaluation metrics and validation techniques. This helps ensure the models are accurate, reliable, and generalizable to new data.

Deployment and implementation: Integrating the developed models or insights into real-world applications or systems. This may involve building interactive dashboards, creating APIs, or deploying

models in production environments.

Data science finds applications in various fields, including business, finance, healthcare, marketing, social sciences, and more. It enables organizations to uncover patterns, trends, and correlations in their data, make data-driven decisions, automate processes, and gain a competitive advantage.

To perform data science effectively, professionals require a combination of skills, including proficiency in programming languages (such as [Python](#) or [R](#)), knowledge of [statistical analysis](#) and [mathematics](#), familiarity with databases and data manipulation, and expertise in machine learning algorithms and techniques.

Overall, data science plays a crucial role in transforming raw data into valuable insights and actionable intelligence, driving innovation and decision-making in diverse industries.

[Big Data](#)

[Data mining.](#)

[Machine learning.](#)

[Surgical data science.](#)

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