# Bharathidasan University

## Tiruchirappalli, Tamil Nadu

**Programme: M.Tech Geoinformatics**

**Course: Research Ethics, Project Management & IPR**

**Title: Research, Research Types Identification of fields sub field and themes.**

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# Research Methodology

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**Research:**

Meaning

Objectives of research

Types of research

Approaches to geographical research:

*Traditional and Scientific*

Identification of fields

*sub field and themes.*

# MEANING OF RESEARCH

- **Research** in common parlance refers to a search for knowledge.
- Define **research** as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of ***scientific investigation.***
- The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge."[1]
- **Redman and Mory** define research as a "systematized effort to gain new knowledge."[2]
- Some people consider research as a movement, a movement from the **known to the unknown.**
- It is actually a probe and attain full and fuller understanding of the unknown.
- The **systematic approach** concerning generalisation and the formulation of a theory is also research.
- As such the term **'research'** refers to the systematic method consisting of enunciating the problem, formulating a **hypothesis**, **collecting** the **facts** or **data**, **analyzing** the facts and reaching certain conclusions either in the form of **solutions(s**) towards the concerned problem.

# OBJECTIVES OF RESEARCH

The purpose of research is to discover **answers to questions through the application of scientific procedures**.

The main aim of research is to **find out the truth which is hidden** and **which has not been discovered as yet**

1. To gain familiarity with a phenomenon or to achieve new insights into it
   (studies with this object in view are termed as *exploratory* or *formulative* research studies)
2. To portray accurately the characteristics of a particular individual, situation or a group
   (studies with this object in view are known as *descriptive* research studies)
3. To determine the frequency with which something occurs or with which it is associated with something else
   (studies with this object in view are known as *diagnostic* research studies)
4. To test a hypothesis of a causal relationship between variables
   (such studies are known as *hypothesis-testing* research studies)

# MOTIVATION IN RESEARCH

The **possible motives** for doing research may be either one or more of the following:

1. Desire to get a research degree along with its consequential benefits;
2. Desire to face the challenge in solving the unsolved problems, i.e., concern over practical problems initiates research;
3. Desire to get intellectual joy of doing some creative work;
4. Desire to be of service to society;
5. Desire to get respectability.

*Directives Of Government, Employment Conditions, Curiosity about New Things, Desire To Understand Causal Relationships, Social Thinking & Awakening*

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# Types of Research

***Basic research***

- *Seeks generalization*
- *Aims at basic processes*
- *Attempts to explain why things happen*
- *Tries to get all the facts*
- *Reports in technical language of the topic*

***Applied research***

- *Studies individual or specific cases without the objective to generalize*
- *Aims at any variable which makes the desired difference*
- *Tries to say how things can be changed*
- *Tries to correct the facts which are problematic*
- *Reports in common language*

# Types of Research

***Basic and applied research, further divided into three types of research***

***Quantitative research***

- *It is numerical, non-descriptive, applies statistics or mathematics and uses numbers.*
- *It is an iterative process whereby evidence is evaluated.*
- *The results are often presented in tables and graphs.*
- *It is conclusive.*
- *It investigates the what, where and when of decision making.*

***Qualitative research***

- *It is non-numerical, descriptive, applies reasoning and uses words.*
- *Its aim is to get the meaning, feeling and describe the situation.*
- *Qualitative data cannot be graphed.*
- *It is exploratory.*
- *It investigates the why and how of decision making.*

***Mixed research-*** *research that involves the mixing of quantitative and qualitative methods or paradigm characteristics. Nature of data is mixture of variables, words and images.*

# Types of Research : *Other types of research*

***Exploratory Research***

Exploratory research might involve a literature search or conducting focus group interviews. The exploration of new phenomena in this way may help the researcher's need for better understanding, may test the feasibility of a more extensive study, or determine the best methods to be used in a subsequent study. For these reasons, exploratory research is broad in focus and rarely provides definite answers to specific research issues. The objective of exploratory research is to identify key issues and key variables.

***Descriptive research***

The descriptive research is directed toward studying "what" and how many off this "what". Thus, it is directed toward answering questions such as, "What is this?".

***Explanatory research***

- Its primary goal is to understand or to explain relationships.
- It uses correlations to study relationships between dimensions or characteristics off individuals, groups, situations, or events.
- Explanatory research explains (How the parts of a phenomenon are related to each other).
- Explanatory research asks the "Why" question.

# Types of Research : *Other types of research*

**Longitudinal Research**

Research carried out longitudinally involves data collection at multiple points in time. Longitudinal studies may take the form of:

- ***Trend study-*** looks at population characteristics over time, e.g. organizational absenteeism rates during the course of a year

- ***Cohort study-*** traces a sub-population over time, e.g. absenteeism rates for the sales department;

- ***Panel study-*** traces the same sample over time, e.g. graduate career tracks over the period 1990 – 2000 for the same starting cohort.

While longitudinal studies will often be more time consuming and expensive than cross-sectional studies, they are more likely to identify causal relationships between variables.

**Cross-sectional Research**

One-shot or cross-sectional studies are those in which data is gathered once, during a period of days, weeks or months. Many cross-sectional studies are exploratory or descriptive in purpose. They are designed to look at how things are now, without any sense of whether there is a history or trend at work.

## Types of Research : *Other types of research*

**Action research** : Fact findings to improve the quality of action in the social world

**Policy-Oriented Research** : Reports employing this type of research focus on the question 'How can problem 'X' be solved or prevented ?'

**Classification research** : It aims at categorization of units in to groups

- To demonstrate differences
- To explain relationships

**Comparative research:** To identify similarities and differences between units at all levels

**Causal research** : It aims at establishing cause and effect relationship among variable

**Theory-testing research** : It aims at testing validity of a unit

**Theory-building research** : To establish and formulate the theory

## *Geographical Approach*

- **Systematic**: Groups geographical knowledge into categories that can be explored globally.
- **Regional** : Examines systematic relationships between categories for a specific region or location on the planet.
- **Descriptive**: Simply specifies the locations of features and populations.
- **Analytical**: Asks *why* we find features and populations in a specific geographic area.

### Location

Location is defined as a particular place or position. Most studies of geography begin with the mention of this theme of geography. Location can be of two types: absolute location and relative location. In the former case, the location of a place is defined by its latitude and longitude or its exact address.

# *Geographical Approach*

**Human-Environment Interaction**

No other species that has lived on our planet, as per our knowledge to this date, has such a profound effect on the environment as humans. Humans have adapted to the environment in ways that have allowed them to dominate all other species on Earth.

Humans have also achieved what no other species have been capable of doing (at least to such a radical extent): modifying the planet to attain their goals of living. Thus, human-environment interaction needs special emphasis and has been classified as one of the five themes of geography. It involves three distinct aspects, dependency, adaptation, and modification. Dependency explores the ways in which humans are dependent on nature for a living

# *Geographical Approach*

**Region**

An area on the planet that is composed of places with a unifying characteristic is a region, one of the five themes of geography. A region is defined by its uniform physical or human characteristics. A region whose boundaries are formally defined is known as a formal region.

For example, metropolitan cities, districts, provinces, countries, and continents can be regarded as a formal region that is unified by a common political entity.

A functional region usually encompasses a central point with defined boundaries and the area around it that is connected via a well-developed network of transportation and communication systems that facilitates the movement of people, goods, and ideas within that system. A large metropolitan city including its suburbs like the New York City in the United States, Mumbai in India, Tokyo in Japan, or Beijing in China, can be regarded as functional regions.

The third type of region is vernacular region. When places in the world share unifying characteristics, we tend to imagine these places being bound by an "imaginary border". Thus, though physical maps do not formally define the boundaries of such regions, we tend to create “mental maps” of such regions.For example, we often group the countries in the Arabian Peninsula as the “Middle-East region”, though such a region is never mentioned in the physical maps of the world

# *Geographical Approach*

## Place

**Place refers to the physical and human aspects of a location. This theme of geography is associated with toponym (the name of a place), site (the description of the features of the place), and situation (the environmental conditions of the place).**

**Each place in the world has its unique characteristics. The landforms, hydrology, biogeography, pedology, etc., of each place, is different, and so are its patterns of human habitation.**

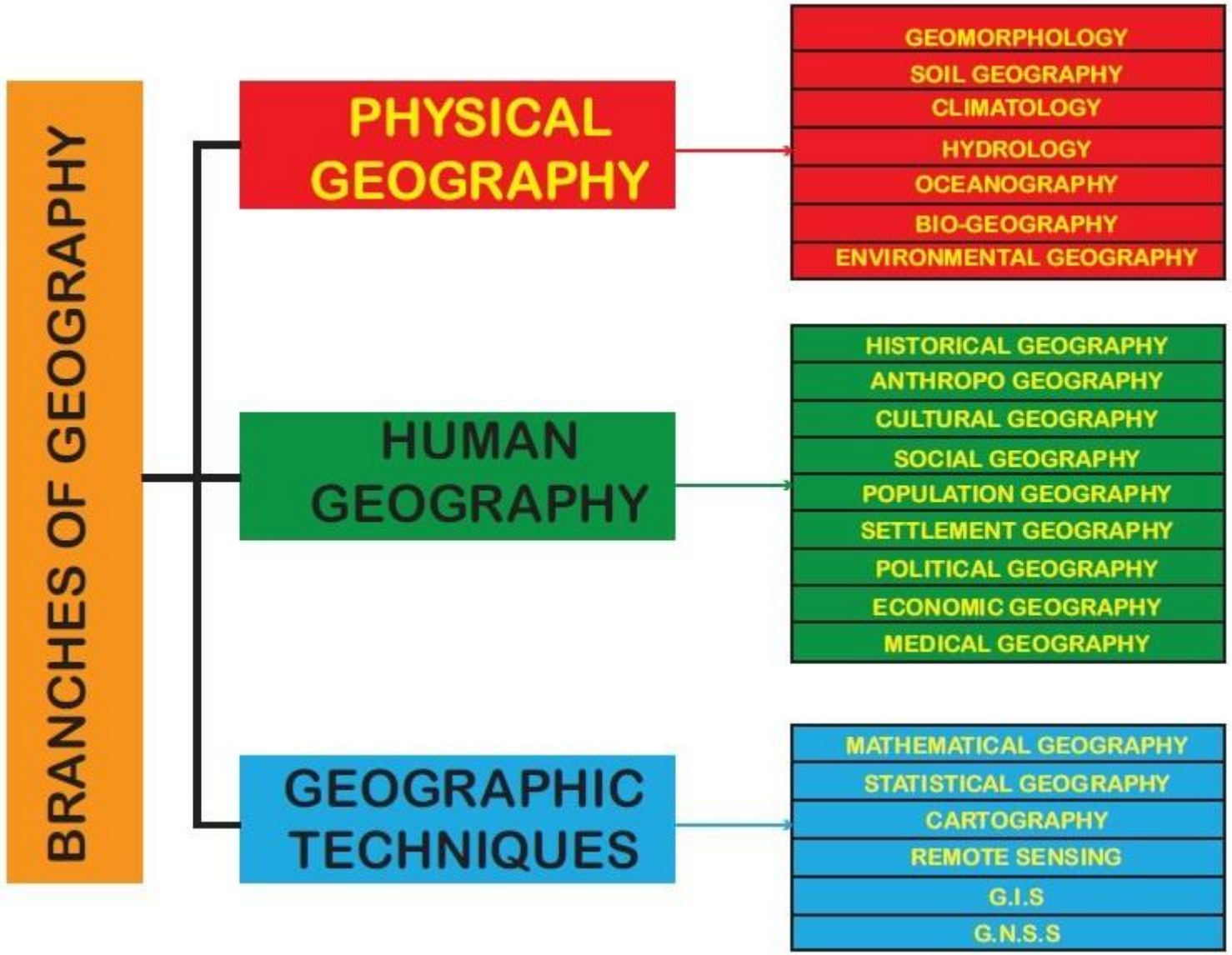
**The human characteristics of place are defined by the nature and size of its human population, the distinct human cultures, their ways of life, etc. The concept of "place" aids geographers to compare and contrast two places on Earth. For example, it helps to distinguish Antarctica from the Sahara**

# *Geographical Approach*

**Movement**

The Earth is full of movement and in a human-dominated planet, movement primarily refers to the translocation of human beings, their goods, and their ideas from one end of the planet to another. Thus, the theme of movement becomes an important part of geographical studies. Movement deals with studies of population immigration, emigration, and distribution in the countries of the world. It is this physical movement of people that has allowed the human race to inhabit all the continents and islands of the world and also explore the depths of the oceans and land on the moon. Another aspect of movement is the transport of goods from one place on the Earth to another. In other words, it is the study of human trade, a practice that has shaped human civilizations and cultures since the time the first Homo sapiens emerged. The third and an extremely vital aspect of the movement theme is the movement of ideas. It is this interchange of ideas between the nations of the world that allows the unification of the human civilization and promotes its growth and prosperity. Thus, the theme of movement forms an integral part of geographical studies

# Identification of fields sub field and themes.

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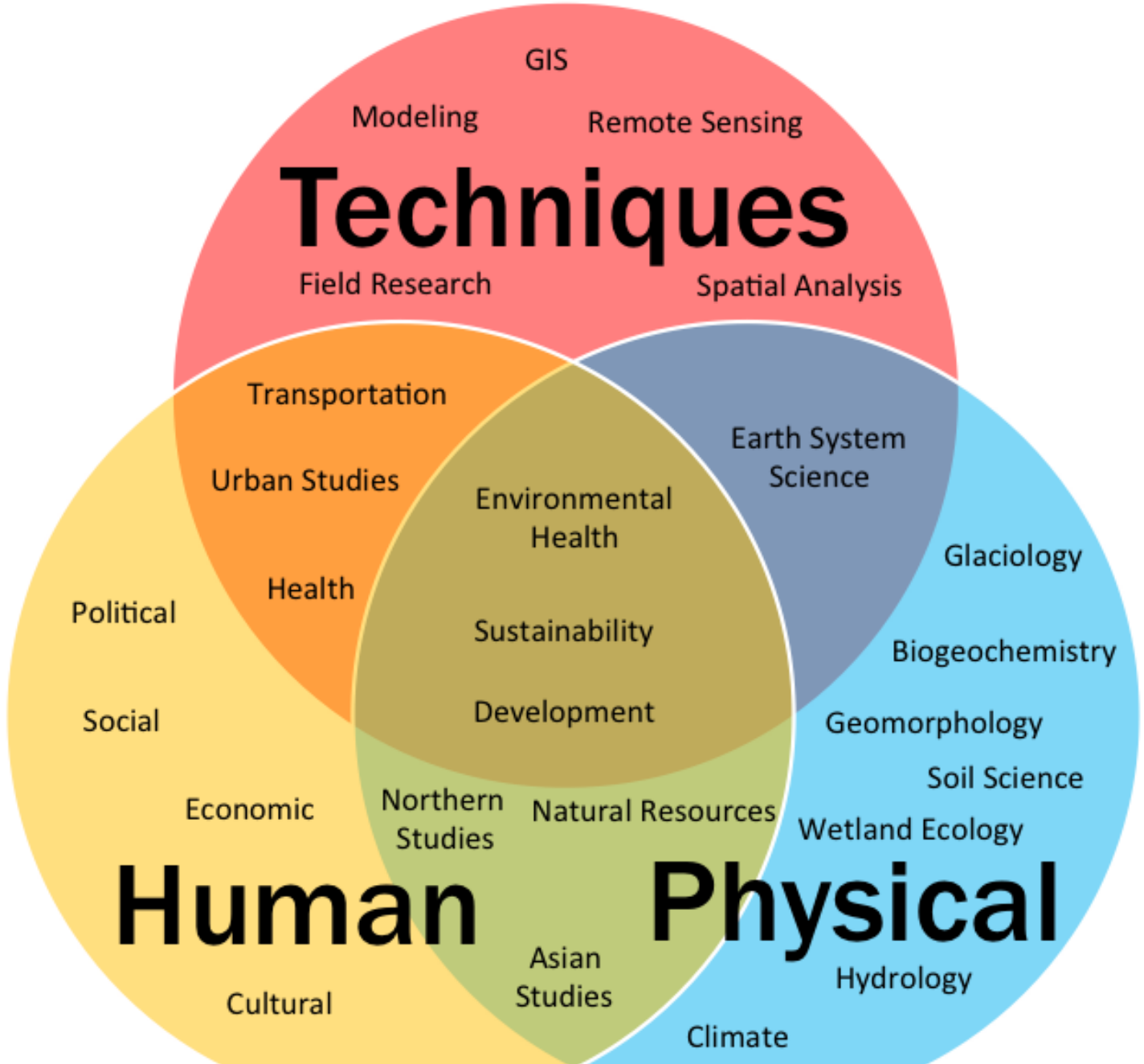
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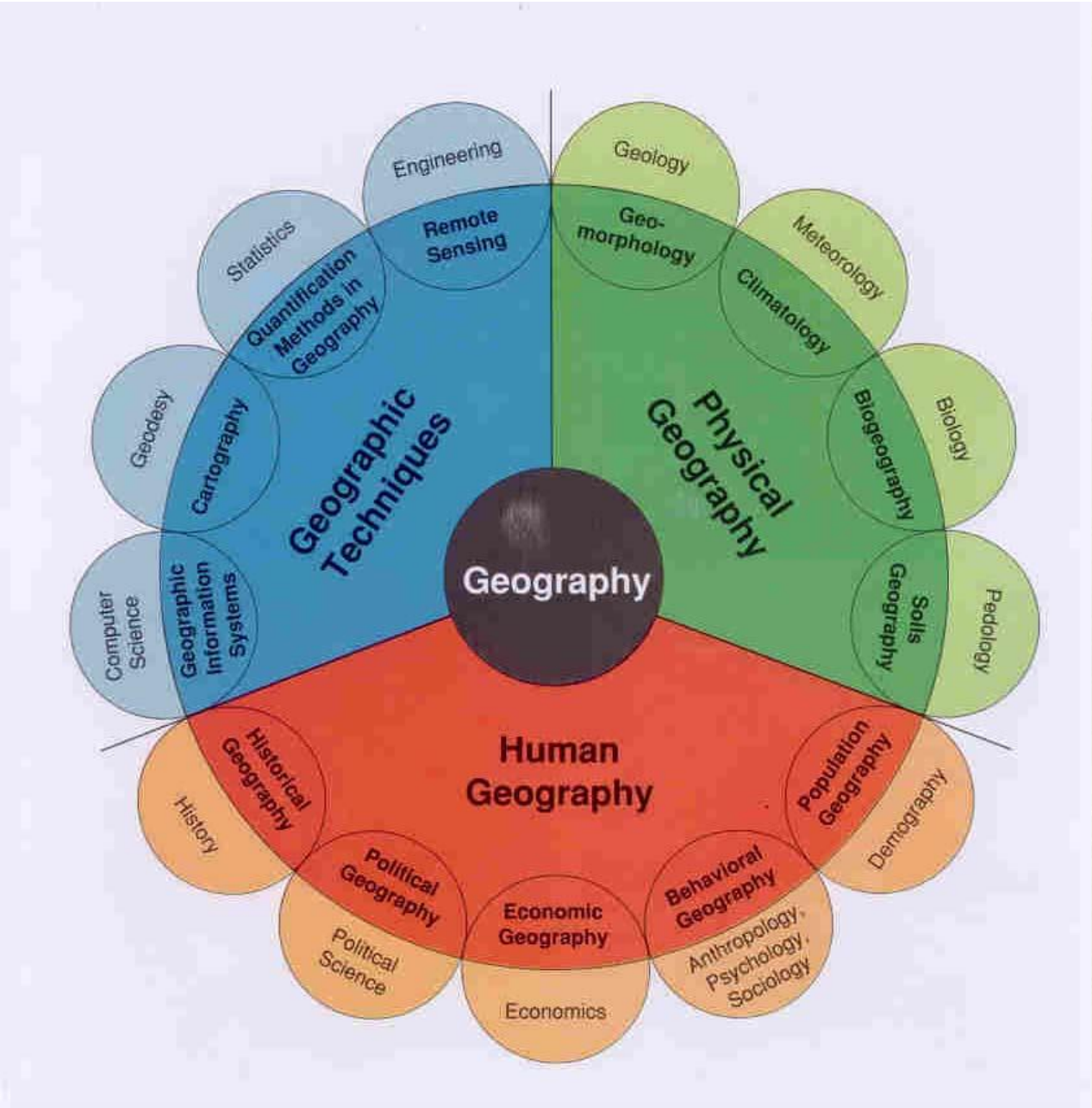
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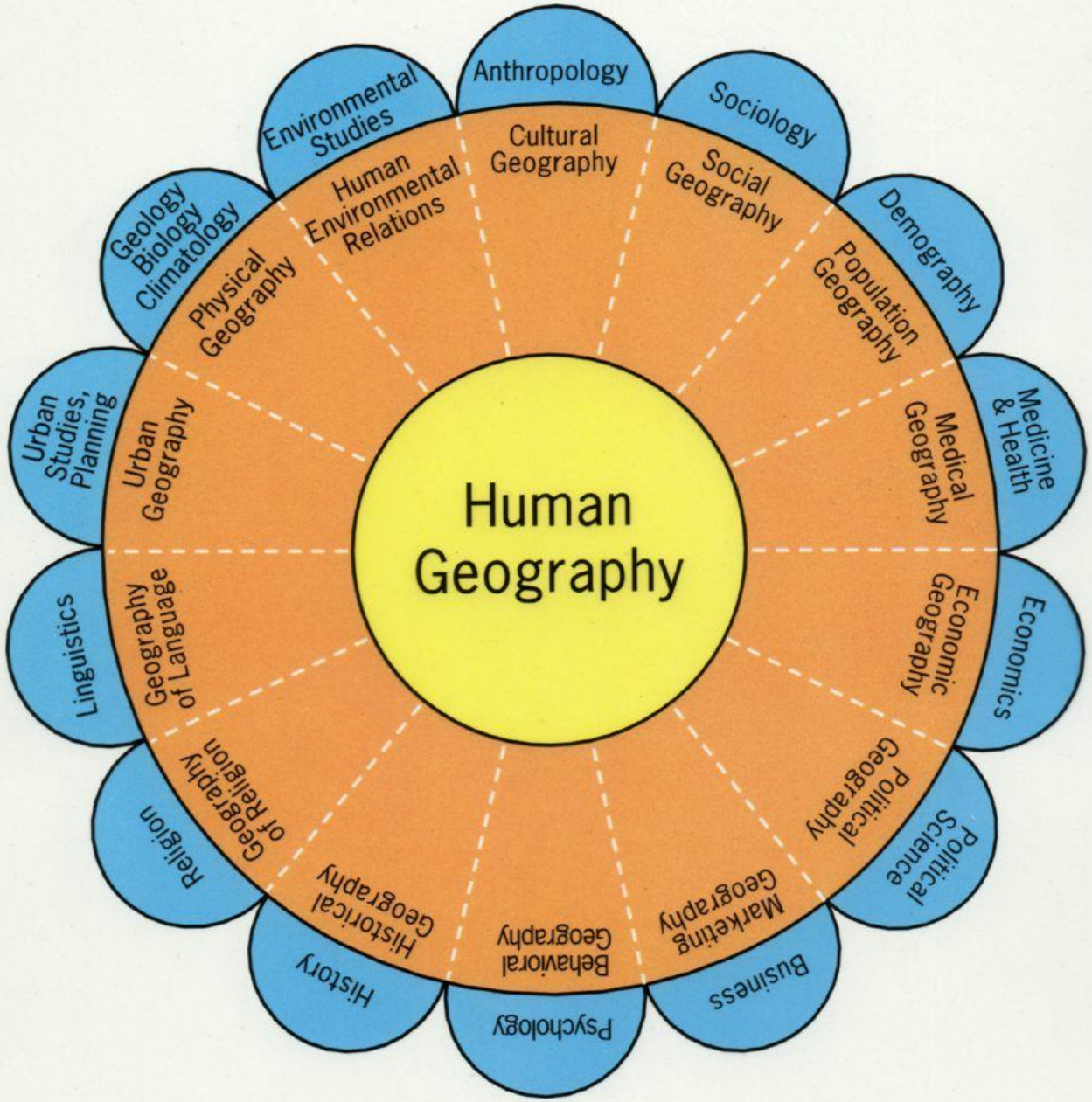
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Geography of Language
Urban Geography
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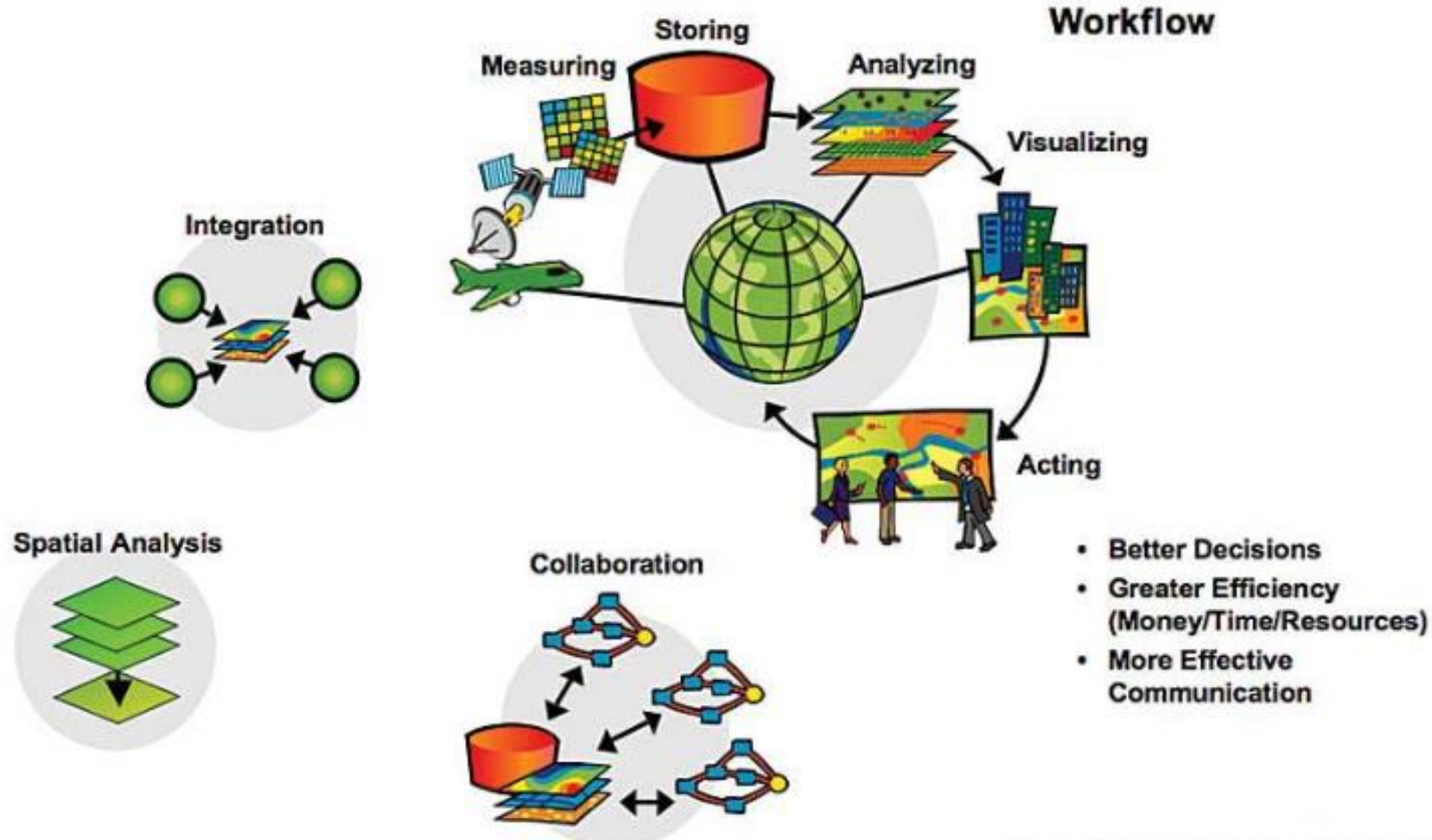
# GIS Applies the Geographic Approach

***Providing Tools, Methods, and Workflows That Support Collaboration and Action***

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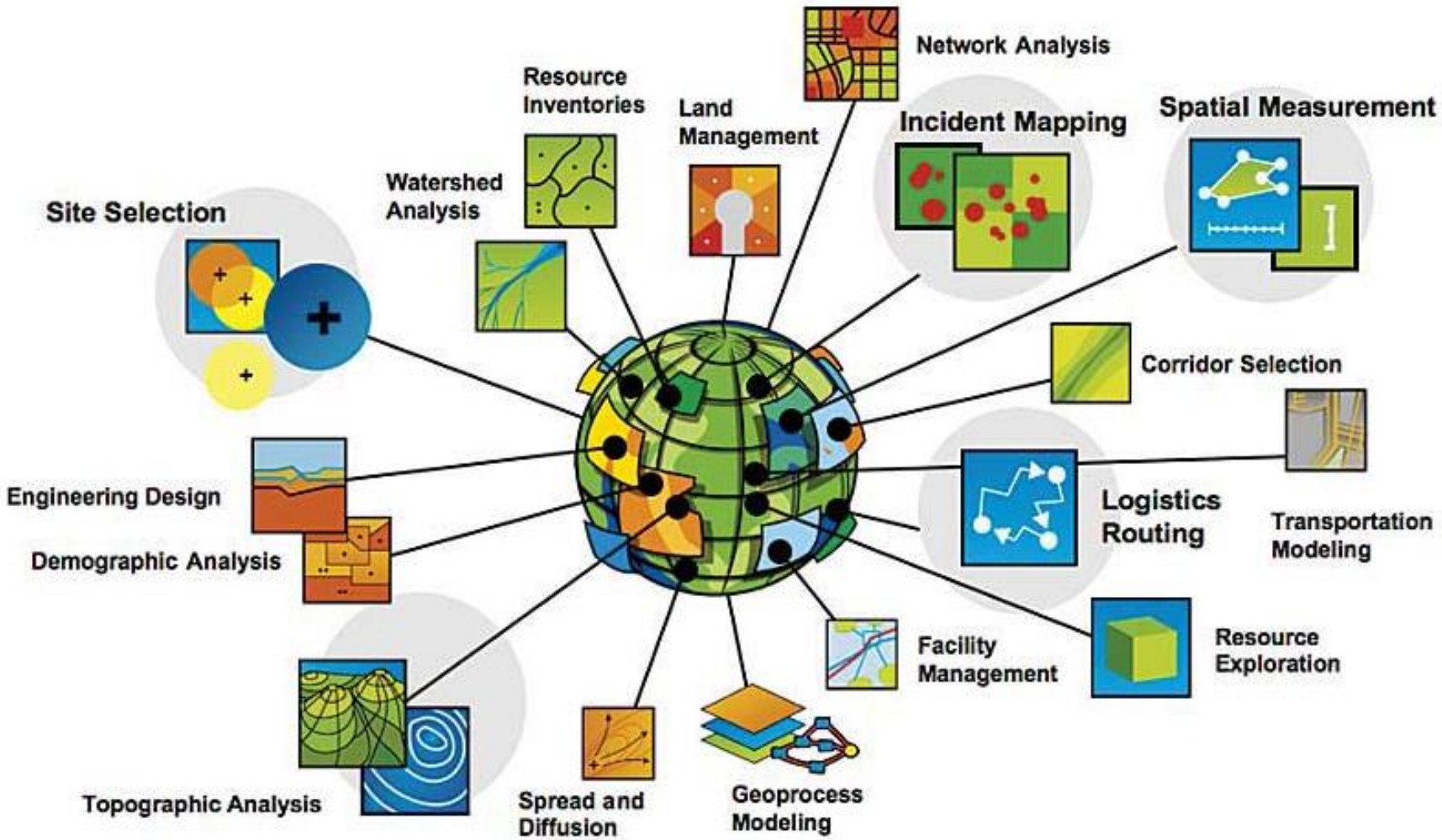
# GIS Is Being Applied Around the World

***Across Many Disciplines, Professions, and Organizations***

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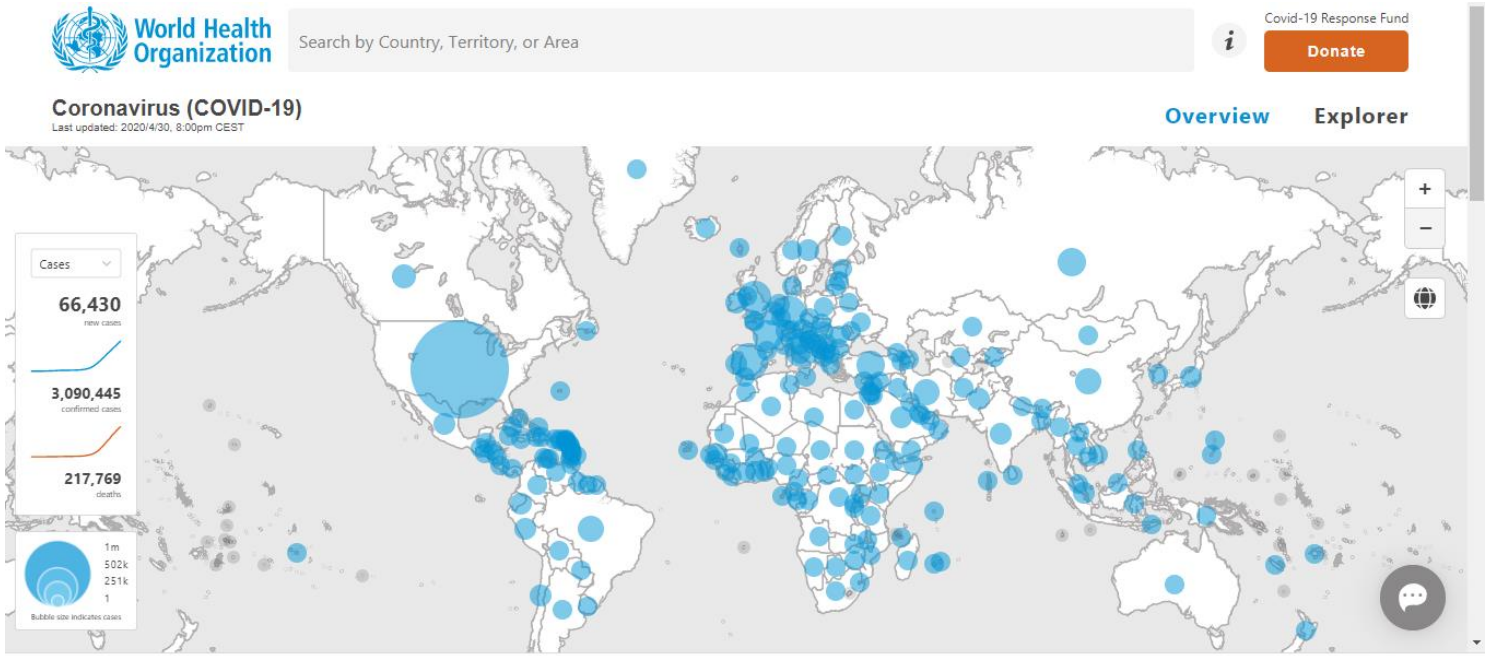
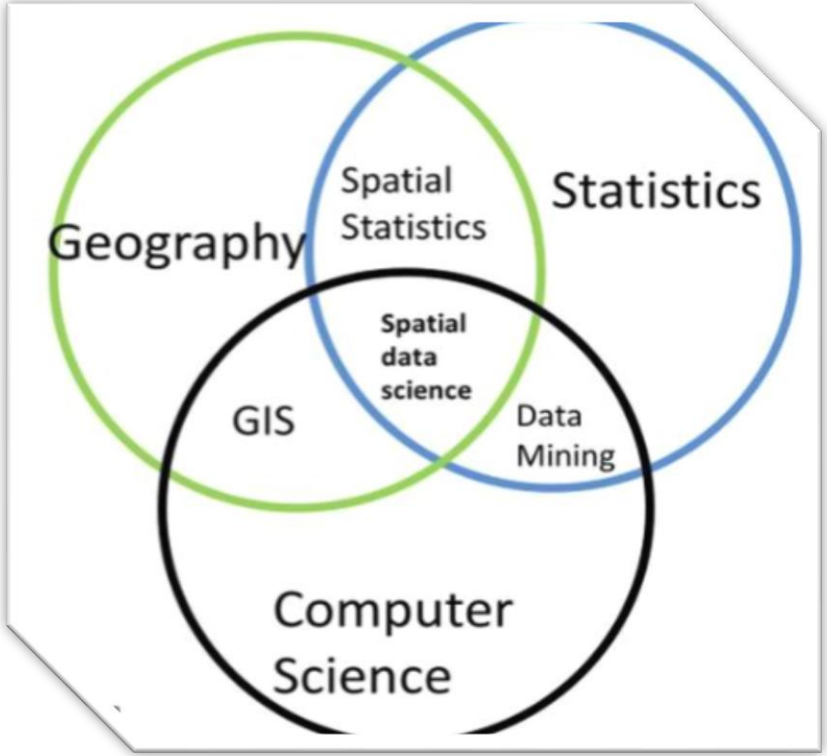
# Future Geography……

- ***Big Data***
- ***Data Science***
- ***Machine Learning***
- ***Geospatial Intelligence***
- ***Artificial Intelligence (AI)***



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*Thank You*