

# Geospatial A/B Testing and Spatial Experiment Design Training Course

Professional Development Training Course Outline

|          |             |               |                         |
|----------|-------------|---------------|-------------------------|
| Category | GIS         | Duration      | 5 Days                  |
| Base Fee | \$1,500 USD | Delivery Mode | Online / On-site Hybrid |

## Course Introduction

In today's data-driven landscape, businesses and organizations are increasingly leveraging **geospatial data** to gain competitive insights and optimize operations. Traditional A/B testing methodologies often fall short when dealing with location-specific interventions, failing to account for **spatial autocorrelation**, **heterogeneity**, and the complex **geographic context**. This specialized training course bridges that gap, empowering professionals with the advanced skills to design, execute, and analyze **geospatial A/B tests** and robust **spatial experiments**. By mastering these techniques, participants will unlock the true **causal impact** of location-based initiatives, driving **data-driven decision-making** and maximizing **ROI** in diverse sectors from retail and logistics to public health and urban planning.

Geospatial A/B Testing and Spatial Experiment Design Training Course delves into the theoretical foundations and practical applications of **spatial statistics**, **experimental design**, and **geospatial analytics**. Participants will learn to define **treatment and control areas** effectively, mitigate **spatial spillover effects**, and select appropriate **geospatial metrics** for accurate measurement. Through hands-on exercises and real-world **case studies**, attendees will gain proficiency in using cutting-edge tools and methodologies to conduct **rigorous spatial experiments**, enabling them to make informed, **location-intelligent** decisions and optimize their strategies for superior **business outcomes** and **impact assessment**.

## Programme Curriculum

### Geospatial A/B Testing and Spatial Experiment Design Training Course

#### Introduction

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### Course Duration

5 days

### Course Objectives

1. Master the fundamentals of experimental design in a geospatial context.
2. Differentiate between traditional A/B testing and spatial A/B testing methodologies.
3. Identify and mitigate common challenges in geospatial experimentation, including spatial confounding and edge effects.
4. Design statistically robust spatial experiments to measure causal effects of location-based interventions.
5. Select appropriate sampling strategies for geographically distributed populations.
6. Apply advanced spatial statistical techniques for data analysis and inference in A/B tests.
7. Evaluate spatial autocorrelation and heterogeneity in experimental data.
8. Utilize geospatial tools and platforms for experiment execution and monitoring.
9. Interpret results from geospatial A/B tests and communicate actionable insights.
10. Optimize resource allocation and campaign effectiveness using spatial intelligence.
11. Develop ethical considerations and best practices for location-based experimentation.
12. Integrate geospatial A/B testing into broader business intelligence and marketing analytics workflows.
13. Stay current with emerging trends and innovations in spatial data science and experimentation.

### Organizational Benefits

- Enhanced Decision-Making
- Optimized Resource Allocation
- Reduced Risk and Uncertainty.
- Improved ROI on Location-Based Initiatives.
- Competitive Advantage
- Deeper Market Understanding.
- Ethical and Compliant Experimentation.
- Fostered Innovation.

## Target Audience

1. Data Scientists & Analysts.
2. Marketing & Growth Professionals
3. Urban Planners & Smart City Initiatives managers.
4. Retail & E-commerce Strategists
5. Logistics & Supply Chain Managers
6. Public Health Researchers & Epidemiologists
7. Environmental Scientists & Conservationists
8. Business Intelligence (BI) Professionals

## Course Modules

### Module 1: Foundations of Spatial Data and Geospatial Thinking

- Understanding the nature of **geospatial data**: vector, raster, and spatiotemporal data types.
- **Coordinate systems and map projections**: their importance in accurate spatial analysis.
- Introduction to **Geographic Information Systems (GIS)** for data visualization and manipulation.
- Key concepts of **spatial relationships**: proximity, adjacency, containment.
- Case Study: **Analyzing optimal retail store locations** based on demographic data and competitor proximity for a major supermarket chain.

### Module 2: Introduction to A/B Testing & Its Limitations in Spatial Context

- Traditional A/B testing principles: hypothesis formulation, randomization, control vs. treatment groups.
- Statistical significance, p-values, and confidence intervals in A/B testing.
- Challenges of applying traditional A/B testing to **geospatial problems**: spatial autocorrelation, spillover effects, and unobserved spatial heterogeneity.
- Why "random" is not always truly random in a spatial context.
- Case Study: A national coffee chain runs an A/B test on a new loyalty program, but fails to account for **spatial clustering** of early adopters, leading to biased results.

### Module 3: Designing Spatial Experiments: Theory and Practice

- **Quasi-experimental designs** for spatial data: Difference-in-Differences, Regression Discontinuity.
- **Stratified sampling** and **cluster sampling** in spatial contexts.
- Defining **treatment and control geographies**: techniques for spatial randomization and balancing.
- Mitigating **spatial spillover effects** and **contamination** in experimental units.
- Case Study: A ride-sharing company designs a **geo-fenced experiment** to test the impact of surge pricing changes in specific city neighborhoods, carefully selecting control zones to avoid spillover.

### Module 4: Spatial Data Analysis for Experimentation

- **Exploratory Spatial Data Analysis (ESDA)**: identifying spatial patterns and outliers.
- **Measuring spatial autocorrelation**: Moran's I, Geary's C, and local indicators of spatial association (LISA).
- **Spatial regression models**: incorporating spatial dependence into statistical models (SAR, SEM).

- Handling **missing spatial data** and **imputation techniques**.
- Case Study: A public health agency evaluates the effectiveness of a **localized health intervention** by analyzing disease incidence rates using **spatial regression** to account for neighborhood-level socioeconomic factors.

## Module 5: Geospatial A/B Testing Execution and Monitoring

- Tools and platforms for executing **geospatial experiments** (e.g., custom GIS scripts, specialized software).
- **Data collection strategies** for spatial A/B tests: mobile sensors, satellite imagery, GPS tracking.
- Real-time **monitoring** of experiment progress and **key performance indicators (KPIs)**.
- Detecting and responding to unexpected **spatial anomalies** during the experiment.
- Case Study: An e-commerce giant launches a **targeted delivery service** in new regions, using **real-time geospatial analytics** to monitor delivery times and customer satisfaction in test vs. control areas.

## Module 6: Advanced Spatial Experimentation Techniques

- **GeoLift** and other **incrementality testing** methodologies for marketing campaigns.
- **Synthetic control methods** for evaluating interventions in unique geographic areas.
- **Causal inference** with spatial data: leveraging machine learning for improved causal estimation.
- Addressing **treatment effect heterogeneity** across space.
- Case Study: A telecommunications provider uses **GeoLift** to measure the incremental impact of a new **localized advertising campaign** on subscriber growth in specific cities.

## Module 7: Interpreting Results and Communicating Spatial Insights

- Visualizing **geospatial A/B testing results**: heat maps, choropleth maps, and interactive dashboards.
- **Statistical interpretation** of spatial experiment outcomes: understanding confidence intervals in a spatial context.
- Translating complex spatial analytics into **actionable business recommendations**.
- Storytelling with **geospatial data**: presenting findings effectively to diverse stakeholders.
- Case Study: A real estate developer presents findings from a **spatial experiment** on the impact of park proximity on property values, using **interactive maps** and clear statistical summaries for investors.

## Module 8: Ethical Considerations and Future Trends in Spatial Experimentation

- **Data privacy** and **anonymization** in location-based data.
- Ethical implications of **targeting and discrimination** in geospatial interventions.
- Emerging trends: **AI and Machine Learning for spatial experiment design, edge computing** for real-time spatial analysis.
- The role of **geospatial big data** and cloud platforms in scaling experiments.
- Case Study: Discussion on the ethical challenges faced by a government agency using **geospatial A/B testing** to optimize the placement of public services, ensuring equitable access and avoiding biases.

## Training Methodology

- Lectures & Discussions.

- Hands-on Software Labs.
- Real-World Case Studies
- Group Projects & Collaborative Exercises
- Data Challenges
- Q&A Sessions.
- Expert Demonstrations

**Register as a group from 3 participants for a Discount**

Send us an email: [info@fineskilltrainingcenter.com](mailto:info@fineskilltrainingcenter.com) or call +254769199797

### ***Certification***

*Upon successful completion of this training, participants will be issued with a globally- recognized certificate.*

### ***Tailor-Made Course***

*We also offer tailor-made courses based on your needs.*

### **Key Notes**

- a.** The participant must be conversant with English.
- b.** Upon completion of training the participant will be issued with an Authorized Training Certificate
- c.** Course duration is flexible and the contents can be modified to fit any number of days.
- d.** The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.
- e.** One-year post-training support Consultation and Coaching provided after the course.
- f.** Payment should be done at least a week before commence of the training, to FINESKILL TRAINING CENTER account, as indicated in the invoice so as to enable us prepare better for you.

## **Upcoming Scheduled Sessions**

| Start Date  | End Date    | Location | Price   |
|-------------|-------------|----------|---------|
| 07 Sep 2026 | 11 Sep 2026 | Online   | \$1,100 |
| 14 Sep 2026 | 18 Sep 2026 | Online   | \$1,100 |

| Start Date  | End Date    | Location | Price   |
|-------------|-------------|----------|---------|
| 21 Sep 2026 | 25 Sep 2026 | Online   | \$1,100 |
| 28 Sep 2026 | 02 Oct 2026 | Online   | \$1,100 |
| 05 Oct 2026 | 09 Oct 2026 | Online   | \$1,100 |
| 12 Oct 2026 | 16 Oct 2026 | Online   | \$1,100 |
| 19 Oct 2026 | 23 Oct 2026 | Online   | \$1,100 |
| 26 Oct 2026 | 30 Oct 2026 | Online   | \$1,100 |

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

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