Training Course on GPS and Location Data Forensics from Mobile/IoT

Professional Development Training Course Outline

Category	Digital Forensics	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Introduction

This specialized training course is meticulously designed for digital forensic investigators, law enforcement agencies, cybersecurity analysts, and incident response teams who need to master the art of extracting, analyzing, and interpreting GPS and location data from the pervasive landscape of modern mobile devices and Internet of Things (IoT) gadgets. In an era where every smartphone, wearable, smart vehicle, and connected home device is a potential geolocator, the ability to forensically exploit this rich source of geospatial intelligence is paramount. Training Course on GPS and Location Data Forensics from Mobile/IoT equips participants with the cutting-edge methodologies to reconstruct movements, establish alibis, map crime scenes, and trace digital footprints, turning seemingly innocuous data into compelling digital evidence.

The curriculum delves into the diverse origins of location data, spanning GNSS (GPS, GLONASS, Galileo, BeiDou), Wi-Fi positioning, cellular tower triangulation, Bluetooth beacons, and even application-specific location logs. Through extensive hands-on labs and real-world case studies, participants will learn to acquire data from various device types, parse complex proprietary formats, interpret accuracy limitations, and visualize movements effectively. The course also critically addresses the significant privacy implications and legal frameworks (including Kenya's Data Protection Act 2019) surrounding location data, ensuring that all investigative practices are forensically sound and legally admissible, making graduates invaluable assets in any modern digital investigation.

Programme Curriculum

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Course Duration

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Course Objectives

1. Identify and understand the diverse sources of location data on mobile devices and IoT gadgets (GPS, Wi-Fi, Cell Tower, Bluetooth, application-specific).
2. Perform forensically sound data acquisition of GPS and location data from various mobile devices (smartphones, tablets) and IoT devices (wearables, smart home devices, connected vehicles).
3. Extract and analyze raw GNSS (GPS) data, including latitude, longitude, altitude, speed, and timestamp information.
4. Interpret Wi-Fi positioning system (WPS) data (SSIDs, MAC addresses, signal strength) for indoor and outdoor location approximations.
5. Analyze cellular tower triangulation data (Cell ID, LAC, RNC) from mobile network operator (MNO) records and device logs.
6. Investigate Bluetooth beacon data for proximity-based location and asset tracking.

7. Recover and parse location history logs from mobile operating systems (iOS Location Services, Android Location History).
8. Extract geotagged metadata from photos, videos, and other user-generated content for location corroboration.
9. Utilize specialized forensic tools and mapping software for visualization and analysis of location data.
10. Understand the accuracy and limitations of different location data sources and their impact on forensic findings.
11. Reconstruct user movement timelines and establish patterns of life based on correlated geospatial evidence.
12. Navigate privacy concerns and legal requirements (e.g., Kenya Data Protection Act 2019) related to acquiring and using location data.
13. Generate comprehensive forensic reports detailing location data findings, suitable for expert testimony and legal admissibility.

Organizational Benefits

1. Enhanced Investigative Capabilities: Uncover crucial "where and when" evidence for a wide range of cases.
2. Improved Case Resolution Rates: Corroborate or refute alibis, establish suspect presence at crime scenes, and reconstruct incidents more accurately.
3. Faster Incident Response: Quickly map movement patterns in cybersecurity incidents or internal investigations.
4. Optimized Resource Allocation: Utilize location data to narrow down search areas for missing persons or stolen assets.
5. Strengthened Legal Admissibility: Ensure location data is acquired and presented in a forensically sound and legally defensible manner.
6. Proactive Threat Intelligence: Analyze location patterns to identify potential areas of risk or suspicious activity.
7. Cost Savings: Reduce reliance on external geospatial experts by building in-house capabilities.
8. Comprehensive Digital Footprint Analysis: Integrate location data with other digital evidence for a holistic view.
9. Compliance Assurance: Train personnel on the latest privacy laws and ethical guidelines for location data handling.
10. Increased Investigative Efficiency: Streamline analysis processes for large volumes of geospatial data.

Target Participants

- Digital Forensic Examiners

- Law Enforcement (CID, DCI, Anti-Terrorism Police Unit)
- Cybercrime Investigators
- Incident Response Teams
- Insurance Fraud Investigators
- Corporate Security Analysts
- e-Discovery Specialists
- Accident Reconstruction Specialists
- Private Investigators
- Legal Professionals (Prosecutors, Defense Attorneys)

Course Outline

Module 1: Fundamentals of Location Data & GNSS (GPS & Location Basics)

- Introduction to Global Navigation Satellite Systems (GNSS): GPS, GLONASS, Galileo, BeiDou
- How GPS Receivers Work: Triangulation, Trilateration, Satellite Signals
- Understanding Latitude, Longitude, Altitude, and Timestamps
- Accuracy and Error Sources in GPS Data (Multipath, Atmospheric Effects)
- **Case Study**: Interpreting raw GPS coordinates to pinpoint a specific location on a map.

Module 2: Mobile Device Location Data Sources (Mobile Location Forensics)

- Core Location Services in iOS (Apple Location Services)
- Android Location APIs and Location History (Google Location Services)
- Analysis of Wi-Fi Positioning System (WPS) Data (SSIDs, MAC Addresses, RSSI)
- Cellular Tower Triangulation/Geolocation (Cell ID, LAC, RNC, Signal Strength)
- **Case Study**: Extracting Wi-Fi and Cell ID logs from a smartphone to establish indoor locations.

Module 3: IoT Device Location Data & Protocols (IoT Location Forensics)

- Location Data from Wearables (Fitness Trackers, Smartwatches)
- Connected Vehicle Location Data (Telematics, Infotainment Systems)
- Smart Home Devices (Cameras, Hubs) with Location Capabilities
- Bluetooth Low Energy (BLE) Beacons for Proximity and Indoor Tracking
- **Case Study**: Analyzing GPS and activity data from a fitness tracker to reconstruct a user's route.

Module 4: Location Data Acquisition & Preservation (Location Data Acquisition)

- Forensically Sound Acquisition from Mobile Devices (Logical, Physical)
- Extracting Location Data from IoT Device Memory (where accessible)
- Acquiring Data from Cloud-Based Location History Services (e.g., Google Maps Timeline)
- Challenges of Data Volatility and Encryption in Location Data Acquisition
- **Case Study**: Acquiring Google Maps Timeline data via a warrant return.

Module 5: Location Data Artifact Analysis (Geospatial Artifact Analysis)

- Analyzing Geotagged Photos and Videos (EXIF Data)
- Interpreting Location Data from Messaging Apps, Social Media, and Ride-Sharing Services

- Examining Browse History and Search Engine Location Queries
- Analysis of GPS Track Logs, Waypoints, and Routes from Dedicated GPS Devices
- **Case Study**: Correlating geotagged photos with a suspect's declared alibi.

Module 6: Timeline Reconstruction & Visualization (Location Timeline & Mapping)

- Techniques for Building Comprehensive Movement Timelines from Disparate Location Sources
- Correlating Location Data with Communication Records and Other Digital Evidence
- Using GIS Software and Mapping Tools (e.g., Google Earth Pro, ArcGIS) for Visualization
- Identifying Patterns of Life and Anomalous Movements
- **Case Study**: Reconstructing a full day's movement for a suspect using a combination of phone GPS, Wi-Fi, and cell tower data.

Module 7: Accuracy, Validation & Challenges (Location Data Challenges)

- Understanding Location Data Accuracy: GPS Fix, Horizontal/Vertical Dilution of Precision (HDOP/VDOP)
- Challenges with Spoofing, Jamming, and Anti-Forensic Techniques for Location Data
- Dealing with Data Gaps, Inaccuracies, and Overlapping Data Points
- Techniques for Validating Location Data Against Other Evidence
- **Case Study**: Identifying potential GPS spoofing attempts in a vehicle's navigation system.

Module 8: Legal, Ethical & Reporting of Location Data (Location Data Legal & Reporting)

- Legal Frameworks for Accessing Location Data in Kenya (e.g., Data Protection Act 2019, Communications Authority Regulations)
- Privacy Concerns and Consent Issues in Location Data Investigations
- Best Practices for Documenting Location Data Acquisition and Analysis
- Presenting Location Data Findings in Expert Reports and Court Testimony
- **Case Study**: Preparing a mock expert report demonstrating a suspect's presence at a crime scene based on mobile device location data.

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org 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
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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

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