IP-NEXUS

SUPERVISED IP GEOLOCATION SYSTEM

TEAM: **StarCoders**

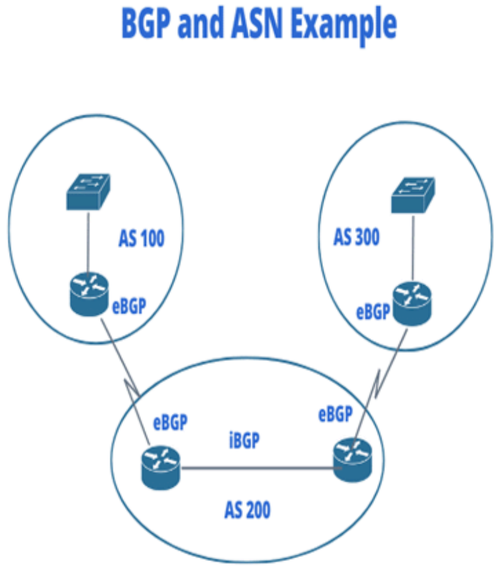
Table Of Contents

PROBLEM DESCRIPTION

- Relies on static rules or outdated databases
- Mostly limited to country-level accuracy
- Inaccurate city data → poor content delivery & weak fraud detection
- Need for a precise, reliable, and up-to-date city-level solution

SOLUTION PROPOSED

- To develop a city-level IP geolocation model using supervised ML
- Combine smart network & behavioral features:
  - ASN, BGP prefix, RTTs
  - Reverse DNS hints, time zones
- Ensure reliability by:
  - Handling rare cities effectively
  - Detecting tricky cases like VPNs
- Returning low-confidence predictions instead of misleading results



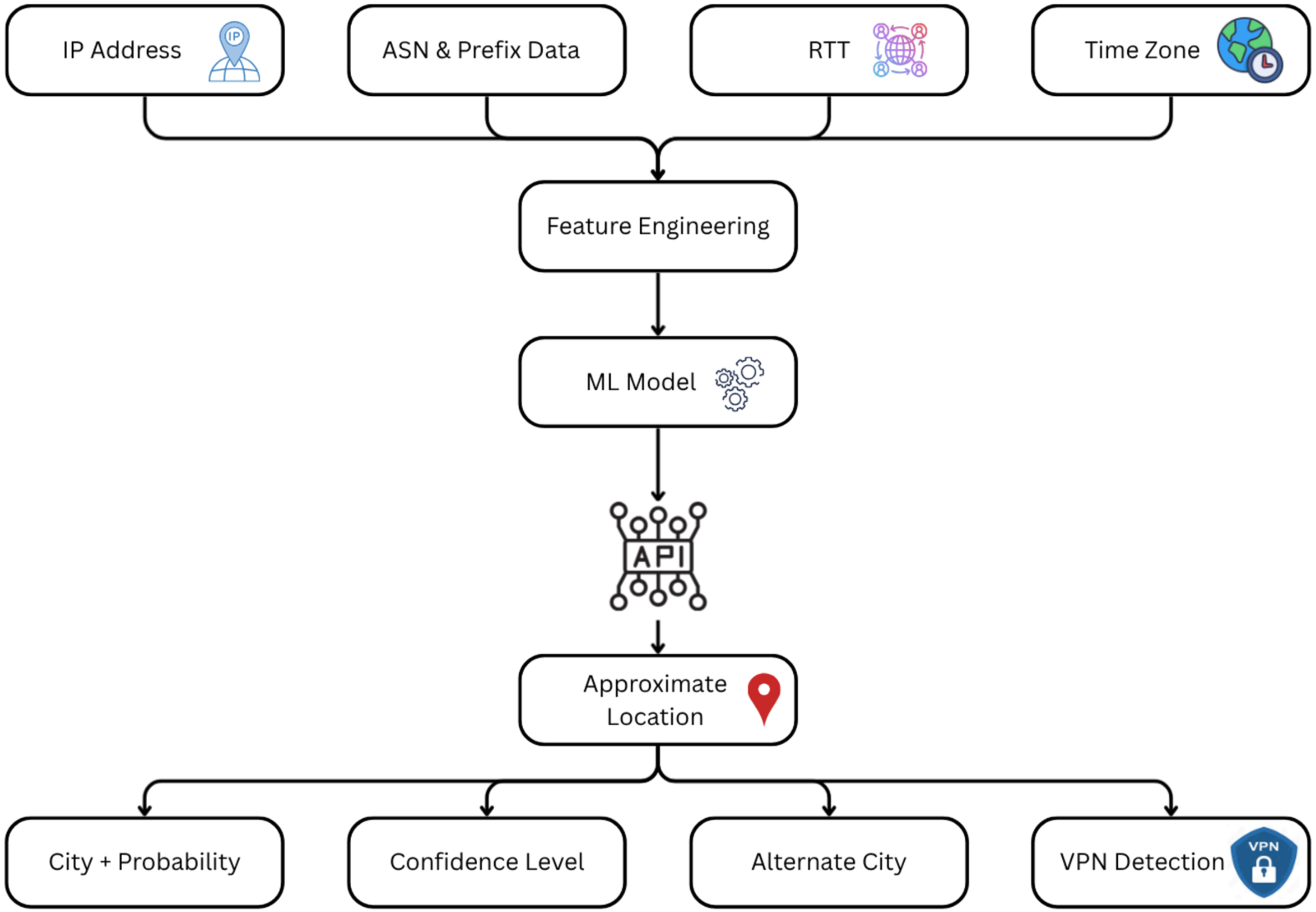
OPTIMIZATION PROPOSED BY THE TEAM

- Predict a “confidence radius” in kilometers showing how far off the location might be.

- Detect VPN and give “low confidence” prediction rather than giving a misleading city.

- Give city level prediction.

SOLUTION ARCHITECTURE AND DESIGN



TIMELINE

Requirement Analysis

8th October 2025

Design Completion

17th October 2025

Implementation

5st November 2025

Testing & Optimization

7th December 2025

Final Delivery

1st January 2026

REFERENCES LINK

- https://www.researchgate.net/publication/342605673_Detection_of_Virtual_Private_Network_Traffic_Using_Machine_Learning?utm_source=chatgpt.com

- https://www.bigdatacloud.com/blog/why-ip-geolocation-accuracy-makes-or-breaks-ad-tech?utm_source=chatgpt.com

- https://docs.fortinet.com/document/fortigate/6.2.0/new-features/520349/recognize-anycast-address-in-geo-ip-blocking?utm_source=chatgpt.com

CONCLUSION

- This project creates a smarter, machine learning-based way to find where an IP address is located—right down to the city.
- Unlike old database methods that can be outdated, this system learns from real network data and improves over time.
- It blends many types of signals and checking how confident each prediction is.
- It delivers more accurate with city level prediction.