Combined Neural Networks Architecture

Input Features (Continuous)

Level 1
Continent

Continent Classifier → Continent Probabilities

Level 2
City

City Classifier → City Probabilities

Level 3
Coordinates

Coordinate Regressor → Predicted Coordinates (x, y, z)

Weighted Losses:
$$\mathcal{L}_{total} = w_1 \mathcal{L}_{continent} + w_2 \mathcal{L}_{city} + w_3 \mathcal{L}_{coordinate}, \quad w_1 > w_2 > w_3$$

→ Forward (Inference)

→ Weighted Backpropagation (all levels)

→ Feature Concatenation