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Why Models Fail Locally:
Rethinking Geospatial Intelligence in Data-Limited Urban Markets

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WHEN GEOSPATIAL INTELLIGENCE BECOMES UNRELIABLE

Can we trust our models across all locations?

Data-Limited Markets

- Incomplete & uneven data
- Weak local context representation

Assumption:
Spatial Data → Reliable Outputs

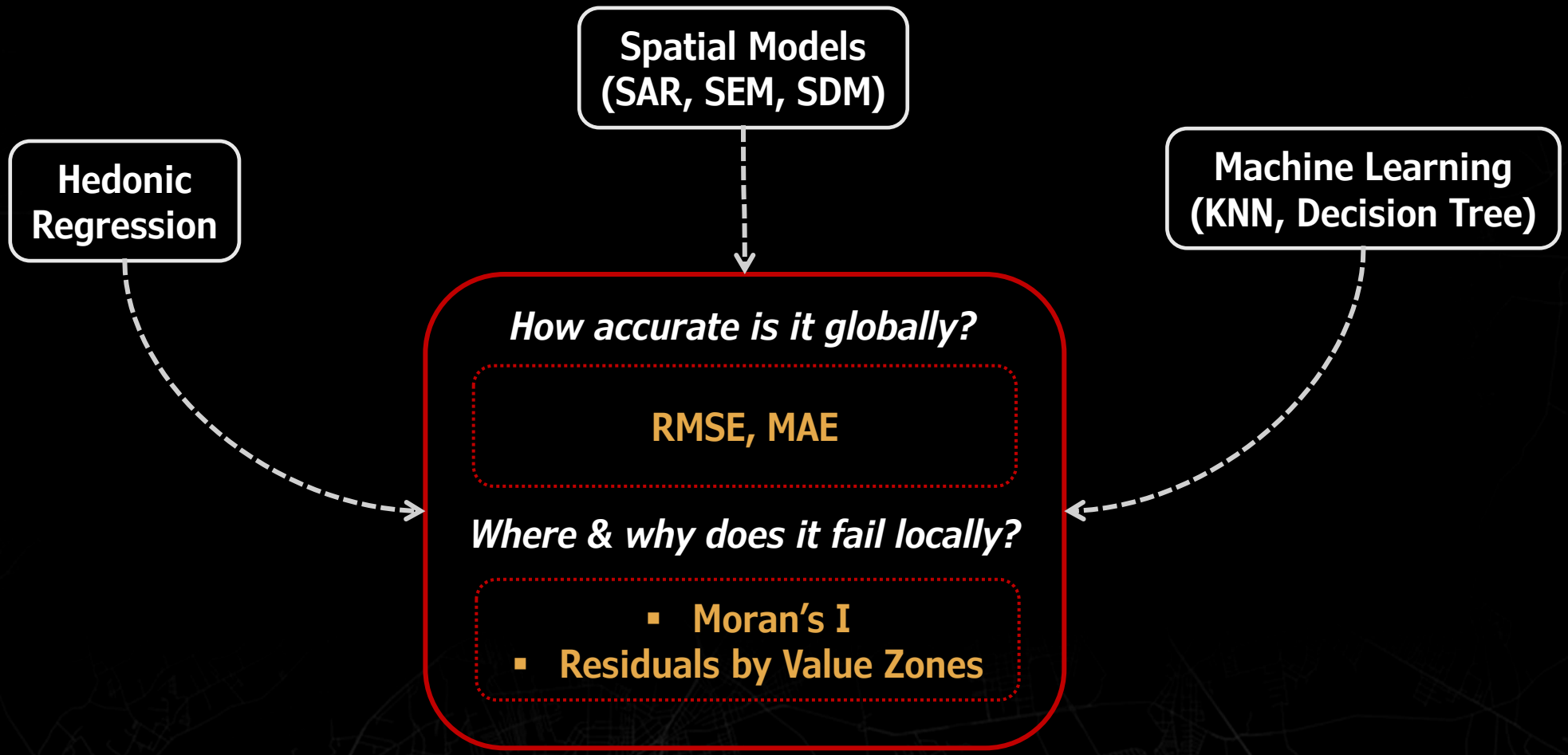
Valuation **Investment** **Planning**

Systematic Decision Risk

Decisions rely on misleading micro-level outputs.

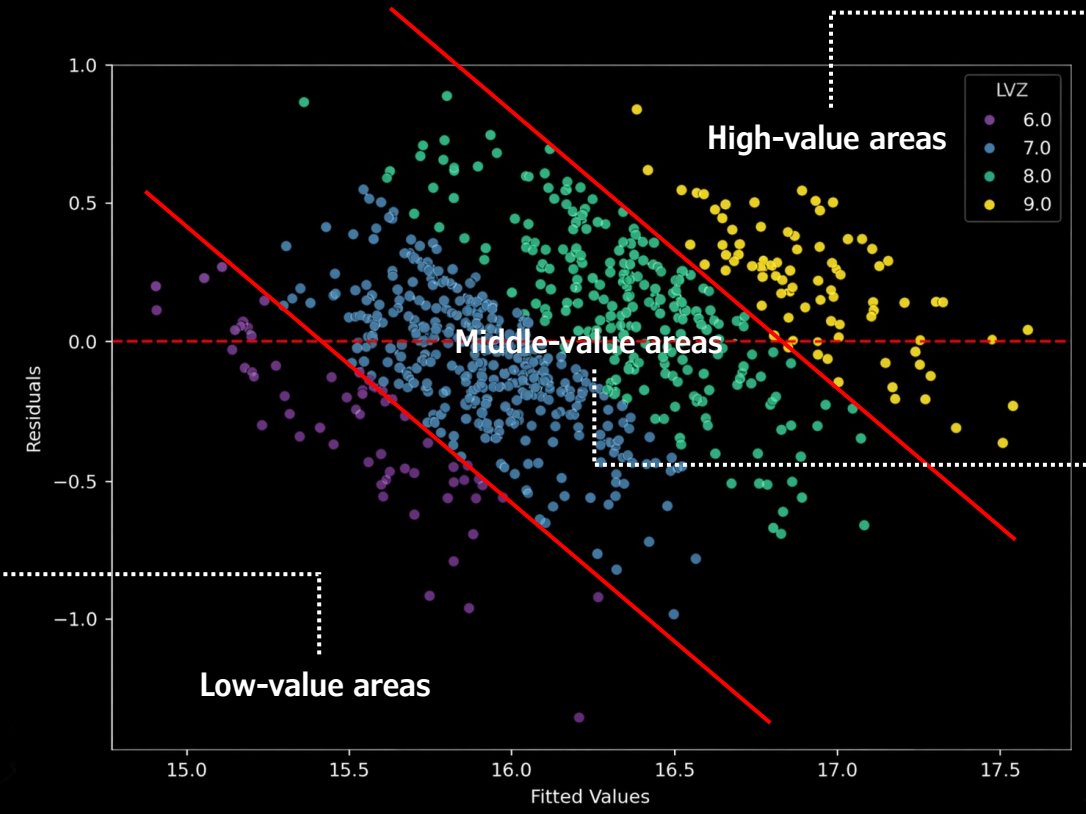
DIAGNOSING WHERE MODELS FAIL

Looking beyond global accuracy to identify the root cause of spatial error



MODELS DON'T FAIL RANDOMLY, THEY FAIL SYSTEMATICALLY

Broad spatial trends are captured, but local variation is severely miscalculated. Even spatial models fail to remove the bias.



Prestige settlement areas
→ Overprediction

A wider mix of settlement form
→ High variability
→ Underprediction

Mature settlement areas
→ Stable & reliable prediction

Errors are structured, not random. Complex models do not eliminate this bias.

THE REAL PROBLEM: MISSING CONTEXT, NOT WEAK MODELS

Geospatial intelligence breaks down when micro-neighbourhood differences and market signals are ignored.

Algorithmic Focus ✕

Prioritising global model selection.

Attempting to solve errors with more mathematical complexity.

Result:

Leaves blind spots in informal and prestige market structures.

Structural Data Focus ✓

Representing true spatial heterogeneity.

Incorporating micro-local context and market signals.

Allowing relationships to vary dynamically across space.

Mitigating systematic bias in valuation requires a structural shift in how we source and map local context.