

WiFi signals can be simulated to optimize coverage in a house

Optimization of WiFi Access Point placement in floorplans using signal propagation loss models in Python

INTRODUCTION

- WiFi signal quality is of main importance in life recently
- Poor Access Point placement can create areas of low coverage, or shadowing
- Walls are the main signal attenuation factor in small residences

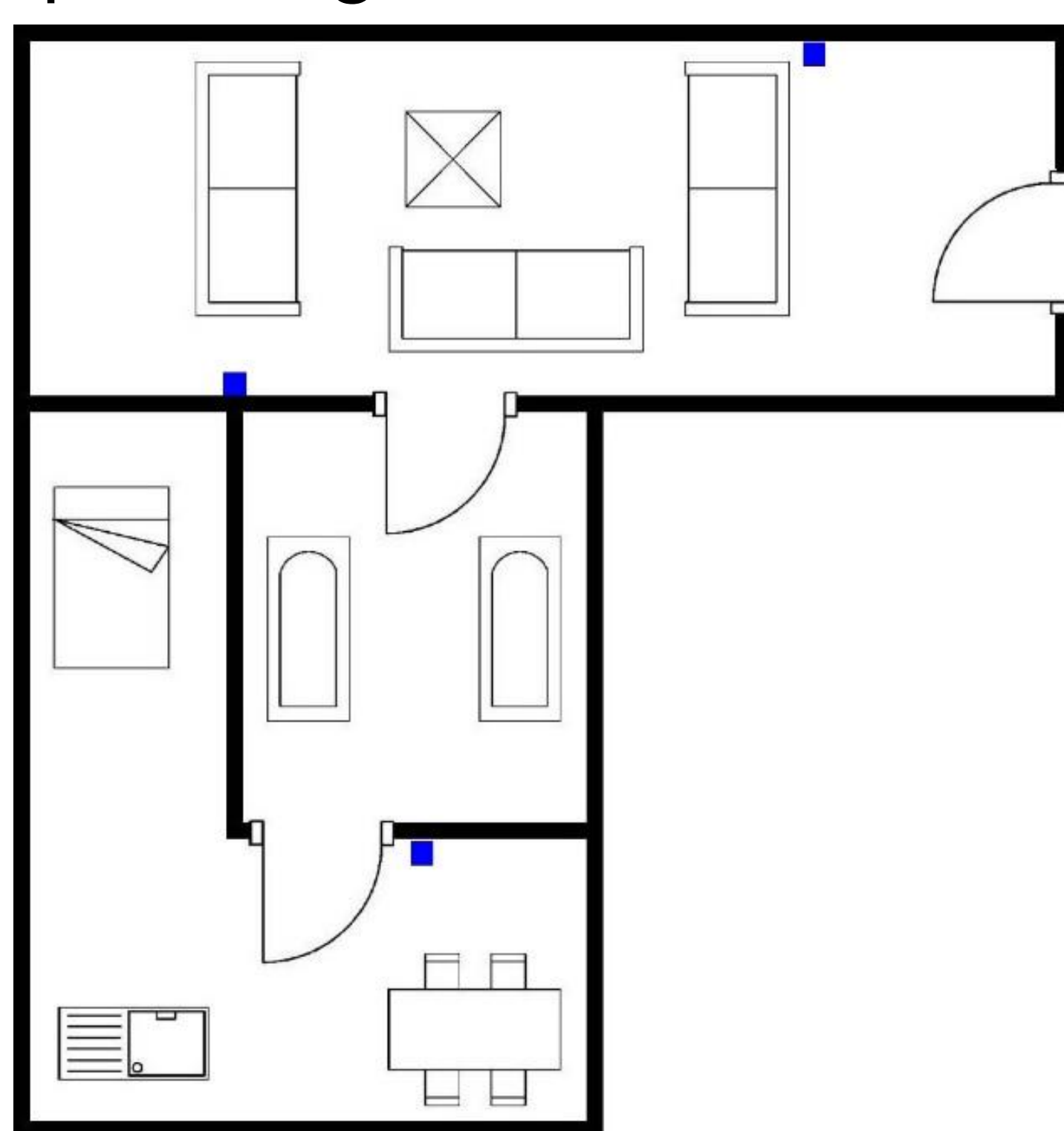
METHODS

1. Process house floorplan to eliminate small features
2. Identify walls with OpenCV
3. Calculate loss with Average Wall Model

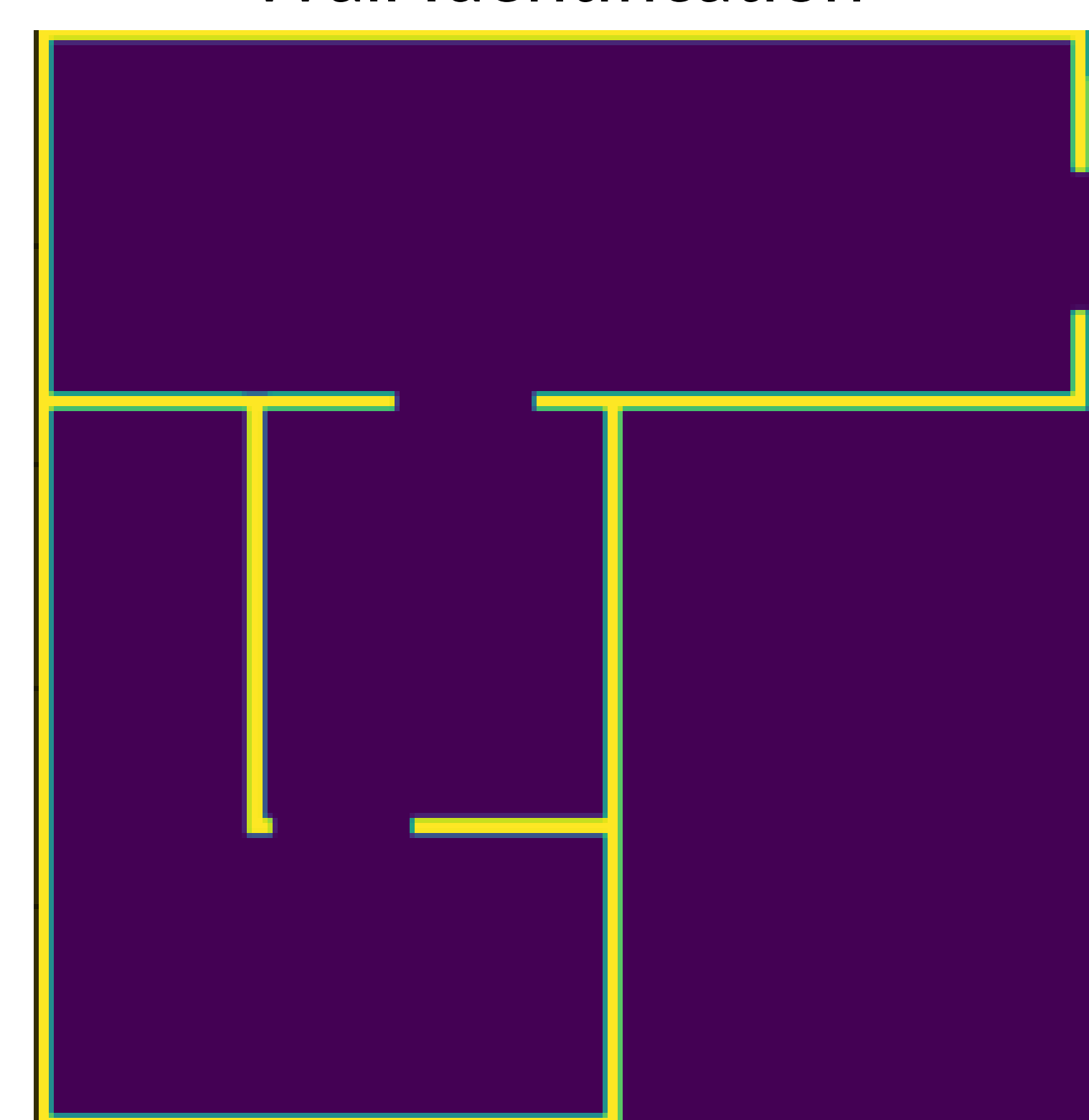
$$L_{dB} = L_{0dB} + 20 \log_{10} d + k_w L_w$$

4. Generate heatmap for all pixels
5. Repeat for all possible AP locations
6. Identify maximum average signal

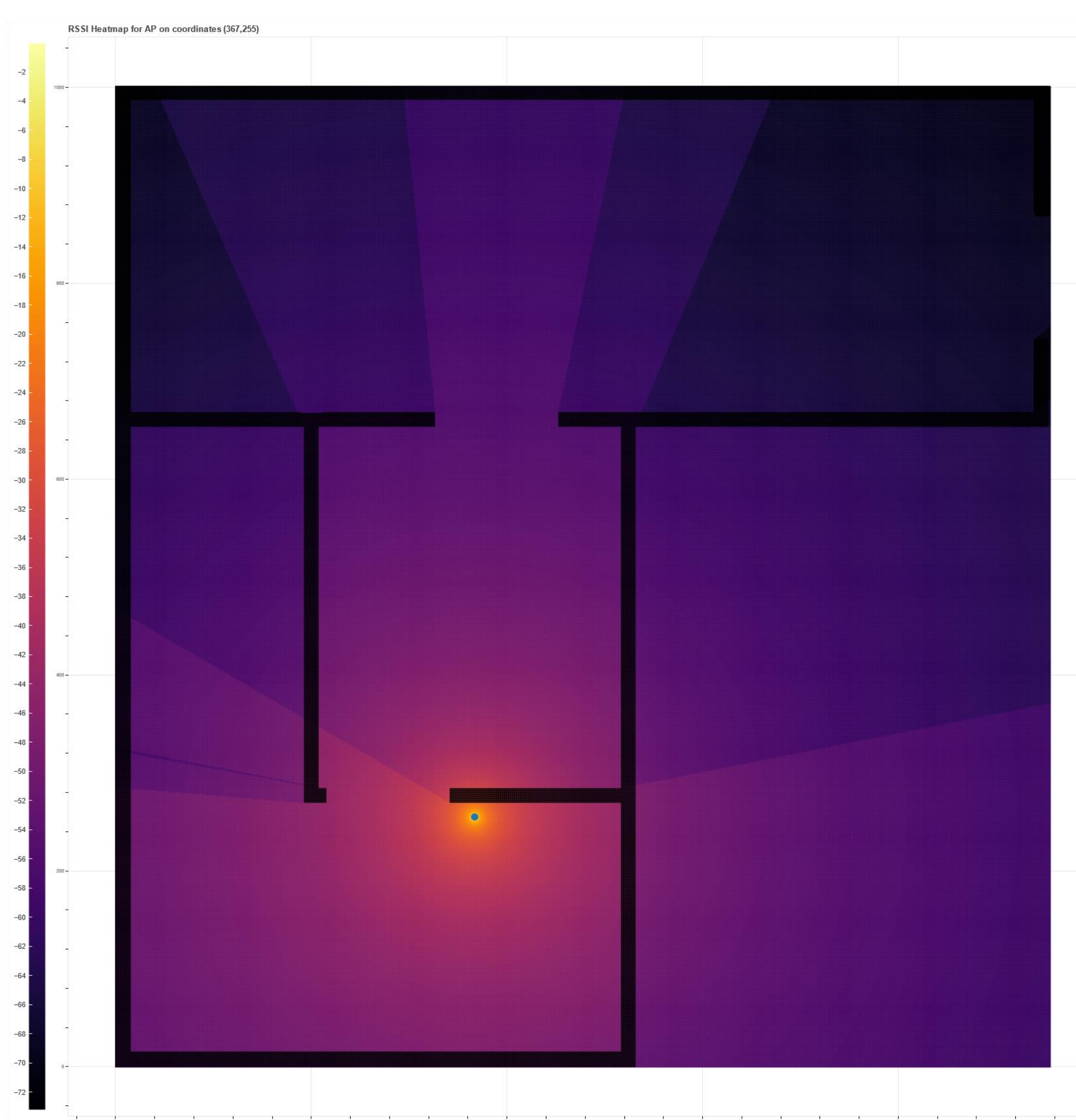
Floorplan image with AP locations (blue)



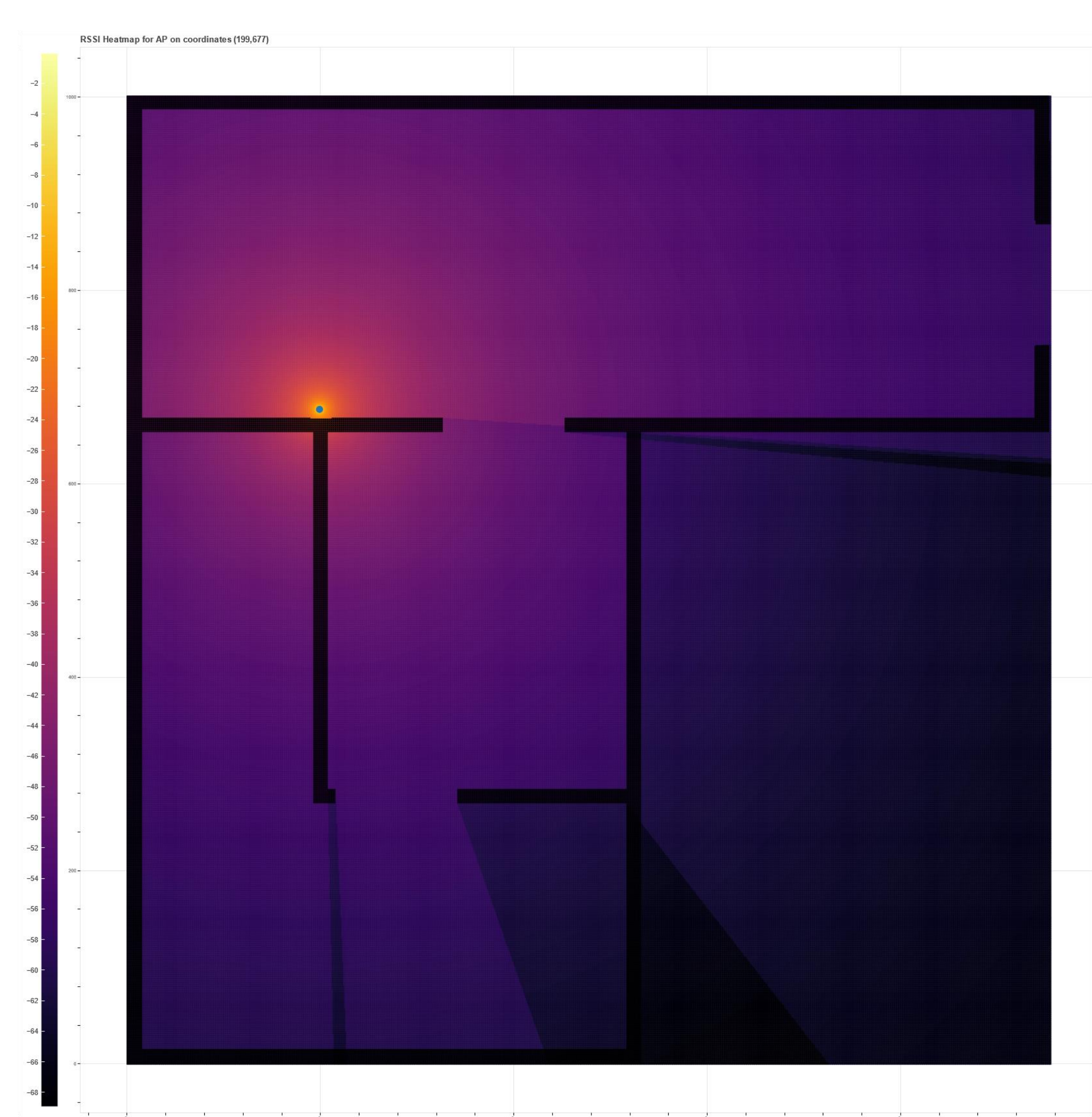
Wall Identification



SIMULATION OUTPUTS



Shadowing in the living room



Good coverage in all rooms

👤 Henrique Silva

