Visualization Term Project

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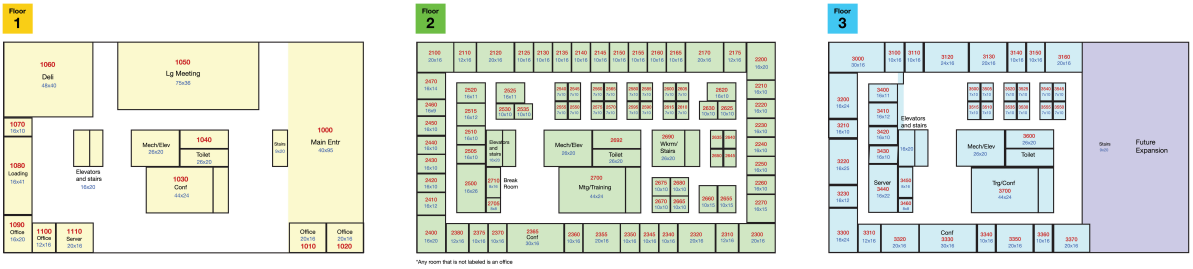
2.1 Building Layout

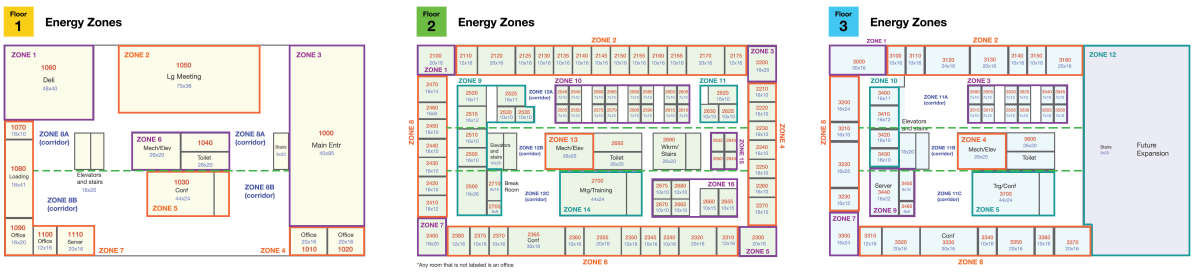
2.1.1 Basic



(a) First Floor (b) Second Floor (c) Third Floor

Figure 1: Main Layout of the building

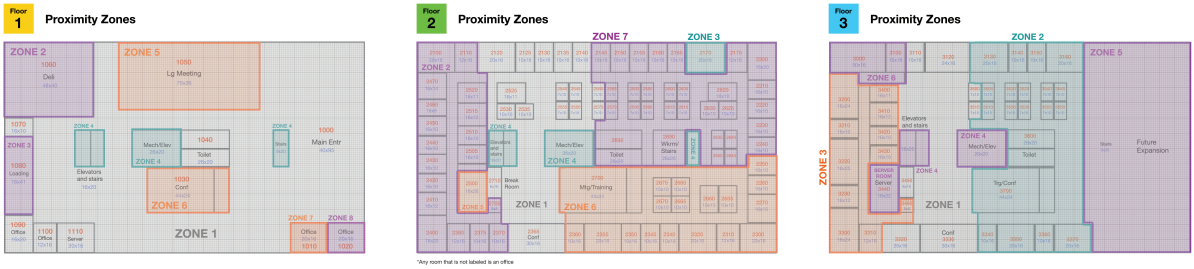
The main layout of this building is as figure 1.



(a) First Floor (b) Second Floor (c) Third Floor

Figure 2: Energy Zone of the Building

The energy zone of this building is as figure 2.



(a) First Floor (b) Second Floor (c) Third Floor

Figure 3: Prox zone of the Building

The prox zone of this building is as figure 3.

3 Methods

3.1 Scikit-learn: Machine Learning in Python

Scikit-learn is a Python module integrating a wide range of state-of-the-art machine learning algorithms for medium-scale supervised and unsupervised problems. [1]

3.2 Matplotlib

Matplotlib is a Python 2D plotting library which produces publication quality figures in a variety of hardcopy formats and interactive environments across platforms. [2]

3.3 Pandas

Pandas is a Python library of rich data structures and tools for working with structured data sets common to statistic, finance, social sciences, and many other fields. [3]

3.4 SciPy

SciPy is a Python-based ecosystem of open-source software for mathematics, science, and engineering. [4]

4 Results

4.1 What are the typical patterns in the prox card data? What does a typical day look like for GAStech employees? Describe up to five of the most interesting patterns that appear in the building data.

4.1.1 Fixed prox data

4.1.2 Mobile prox data

4.2 Describe up to five of the most interesting patterns that appear in the building data. Describe what is notable about the pattern and explain its possible significance.

4.3 Describe up to five notable anomalies or unusual events you see in the data. Prioritize those issue that are most likely to represent a danger or a serious issue for building operations.

4.4 Describe up to three observed relationships between the proximity card data and building data elements. If you find a causal relationship, describe your discovered cause and effect, the evidence you found the support it, and your level of confidence in your assessment of the relationship.

5 Discussion

References

[1] F. Pedregosa, G. Varoquaux, A. Gramfort, V. Michel, B. Thirion, O. Grisel, M. Blondel, P. Prettenhofer, R. Weiss, V. Dubourg, *et al.*, "Scikit-learn: Machine learning in python," *Journal of machine learning research*, vol. 12, no. Oct, pp. 2825–2830, 2011.

[2] J. D. Hunter, "Matplotlib: A 2d graphics environment," *Computing in science & engineering*, vol. 9, no. 3, p. 90, 2007.

[3] W. McKinney, "pandas: a foundational python library for data analysis and statistics," *Python for High Performance and Scientific Computing*, vol. 14, 2011.

[4] E. Jones, T. Oliphant, P. Peterson, *et al.*, "Scipy: Open source scientific tools for python," 2001.