Context-Aware Urban Energy Efficiency Optimization Using Hybrid Physical Models

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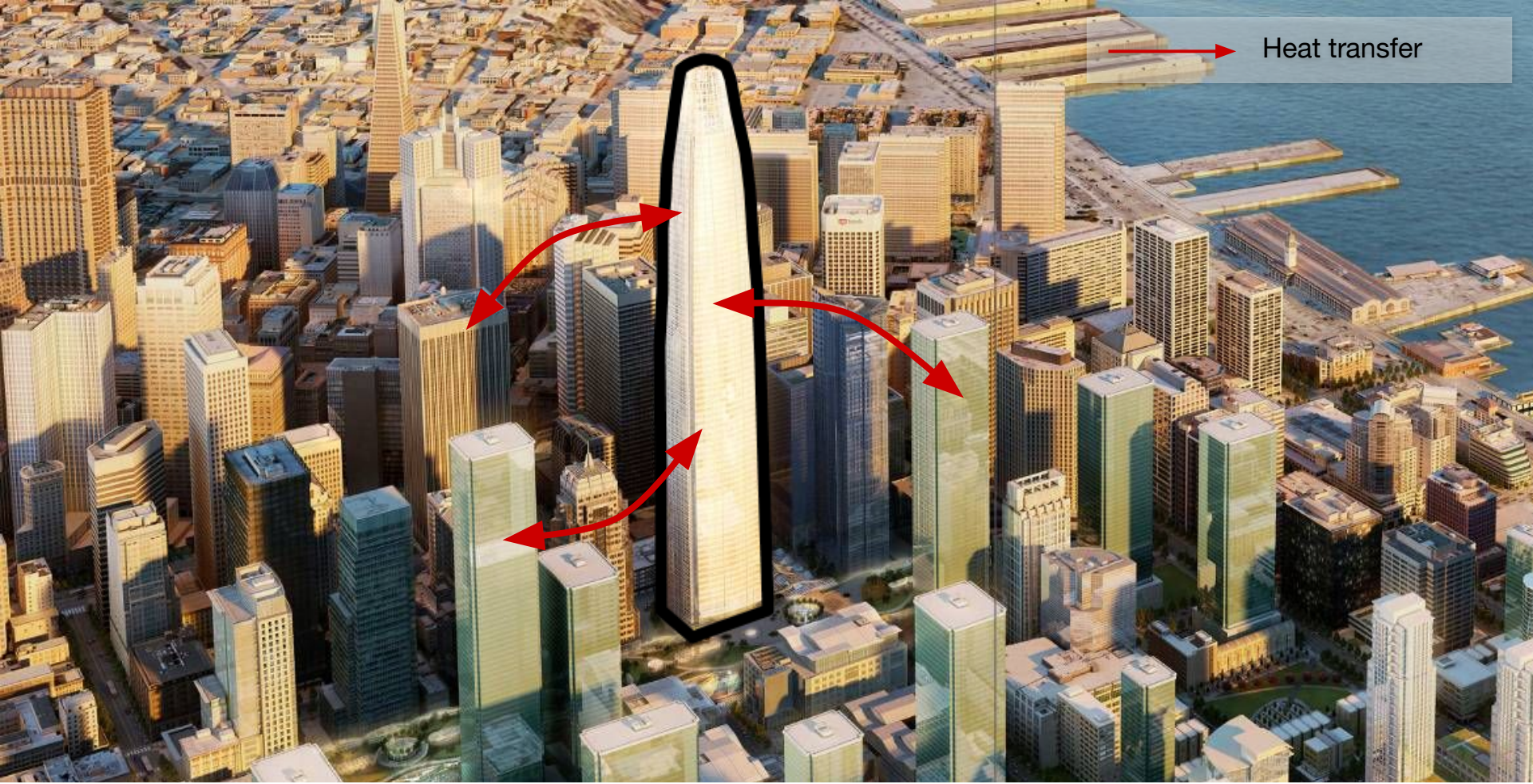

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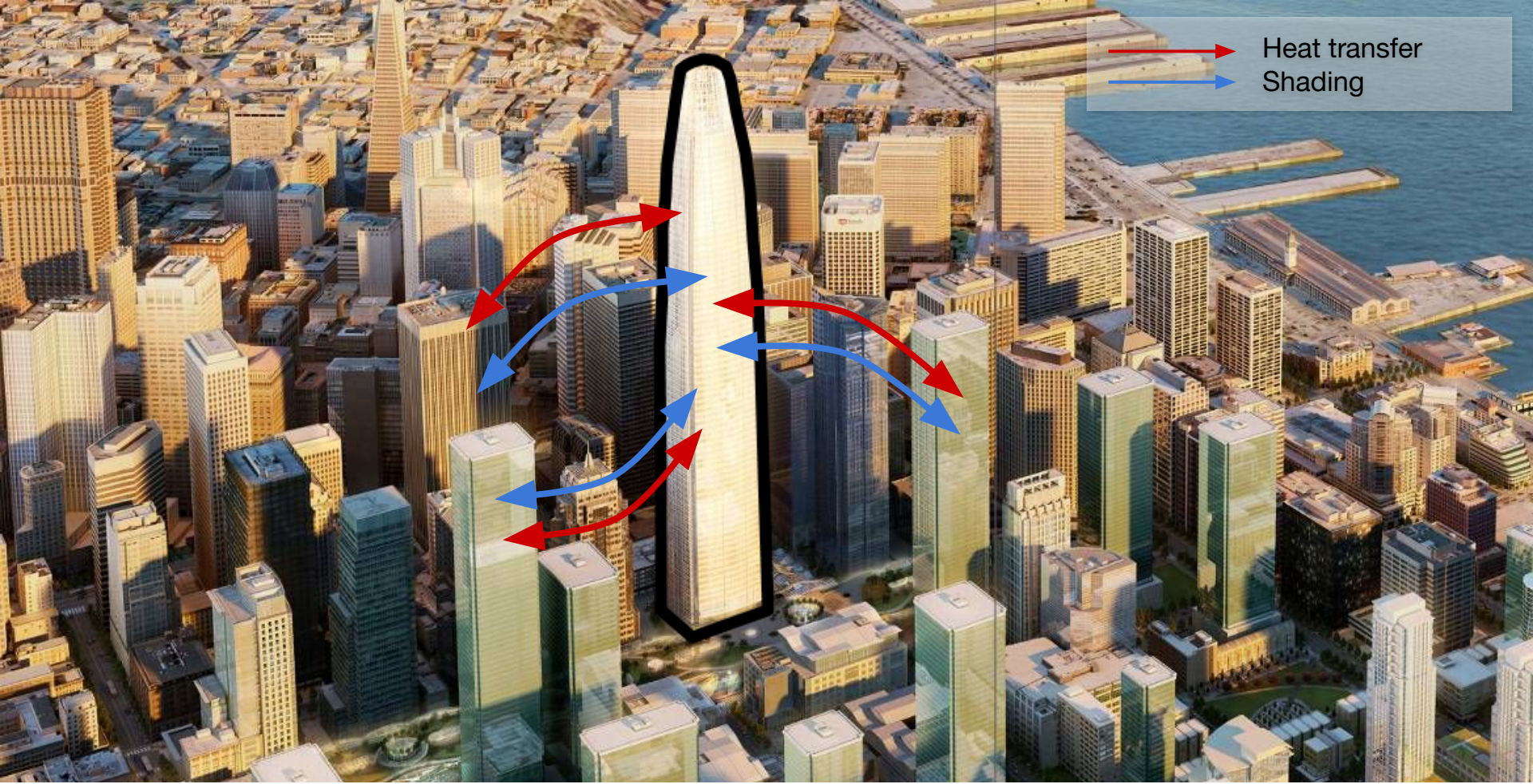

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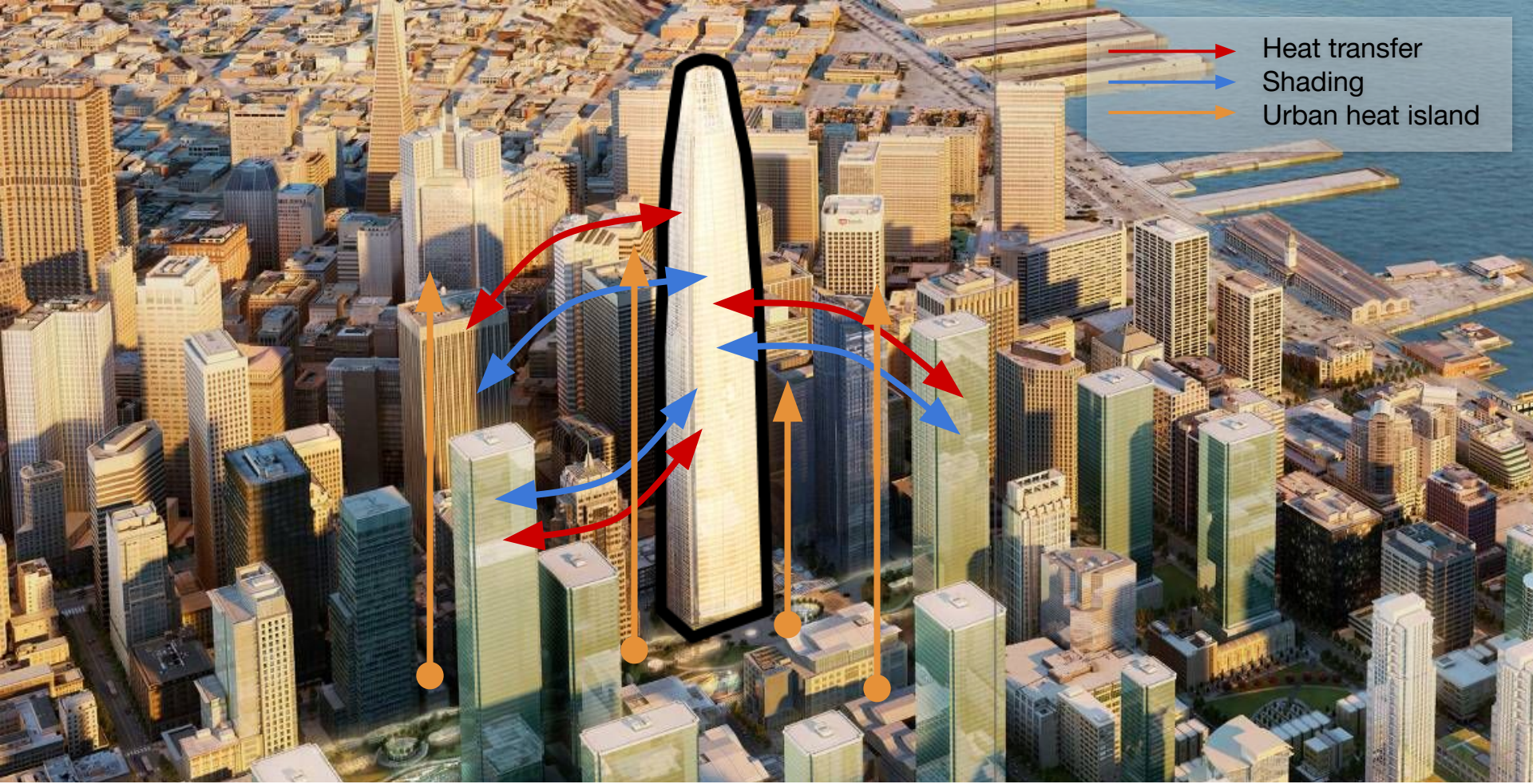

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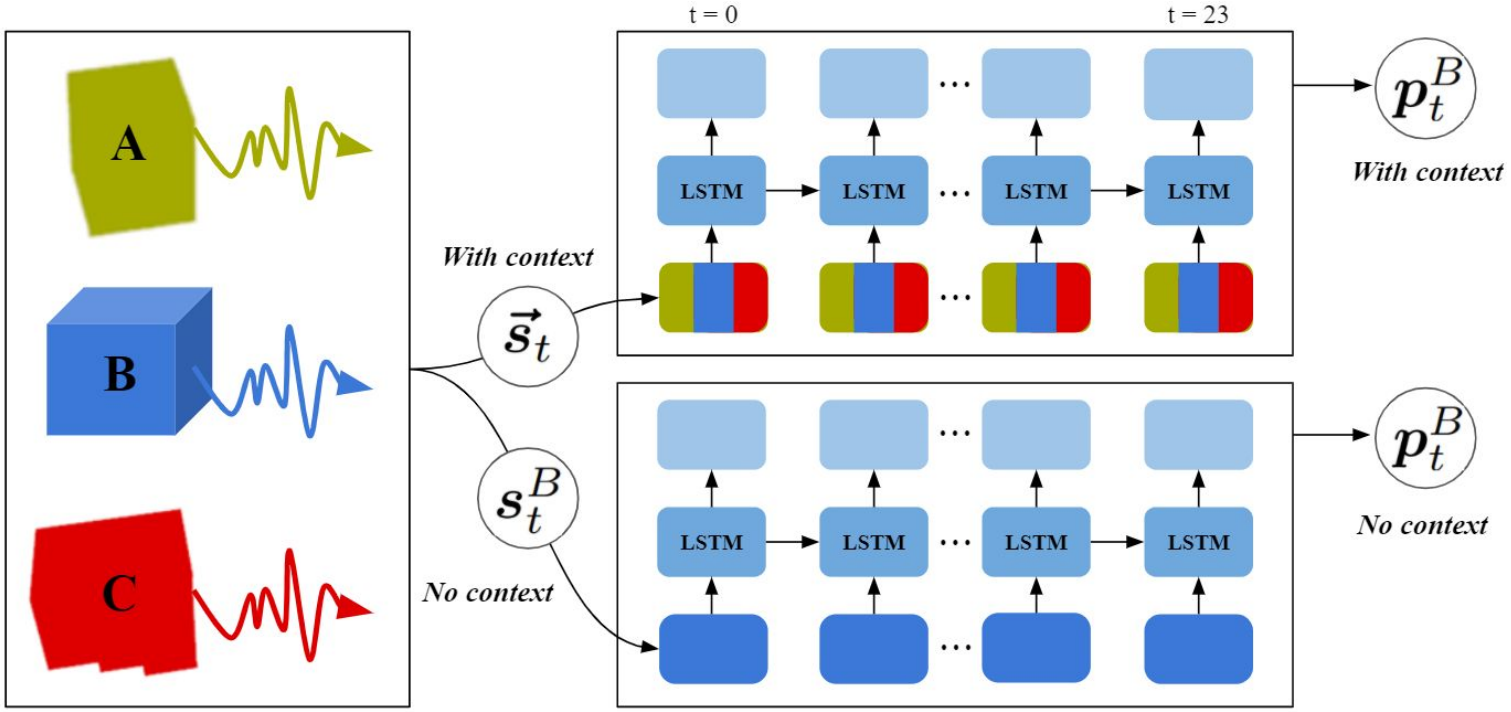
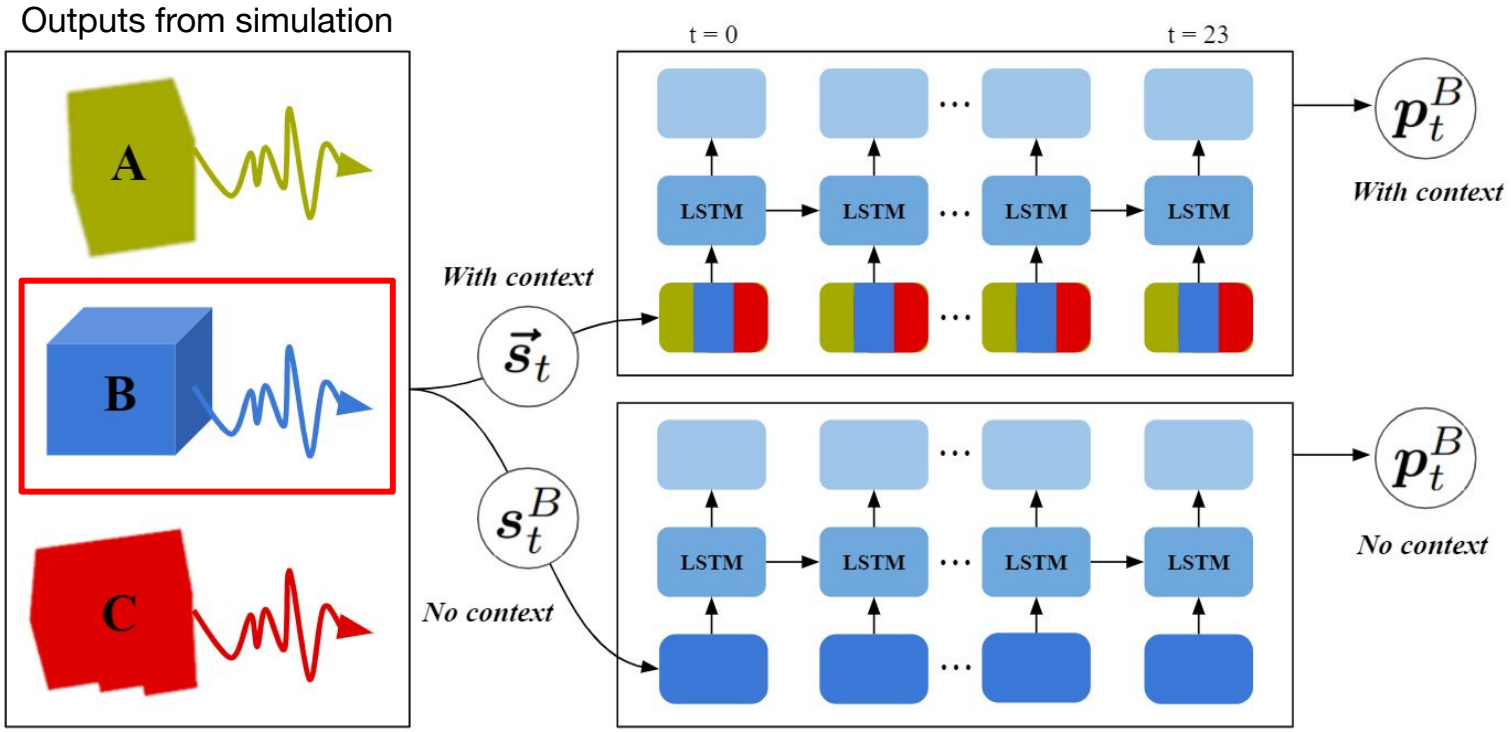
Methods



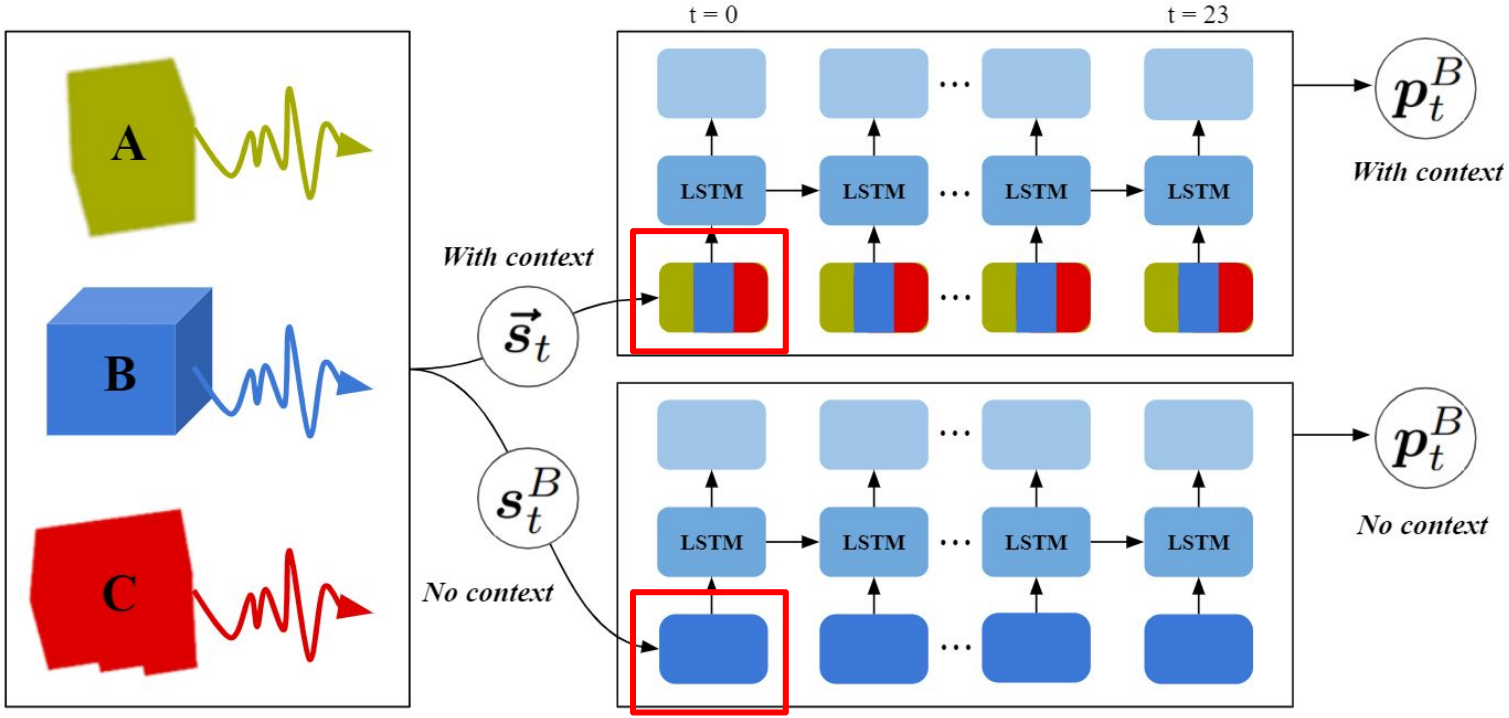
A comparison of *no context* and *with context* methods

Methods



Individual building simulations as input to both methods

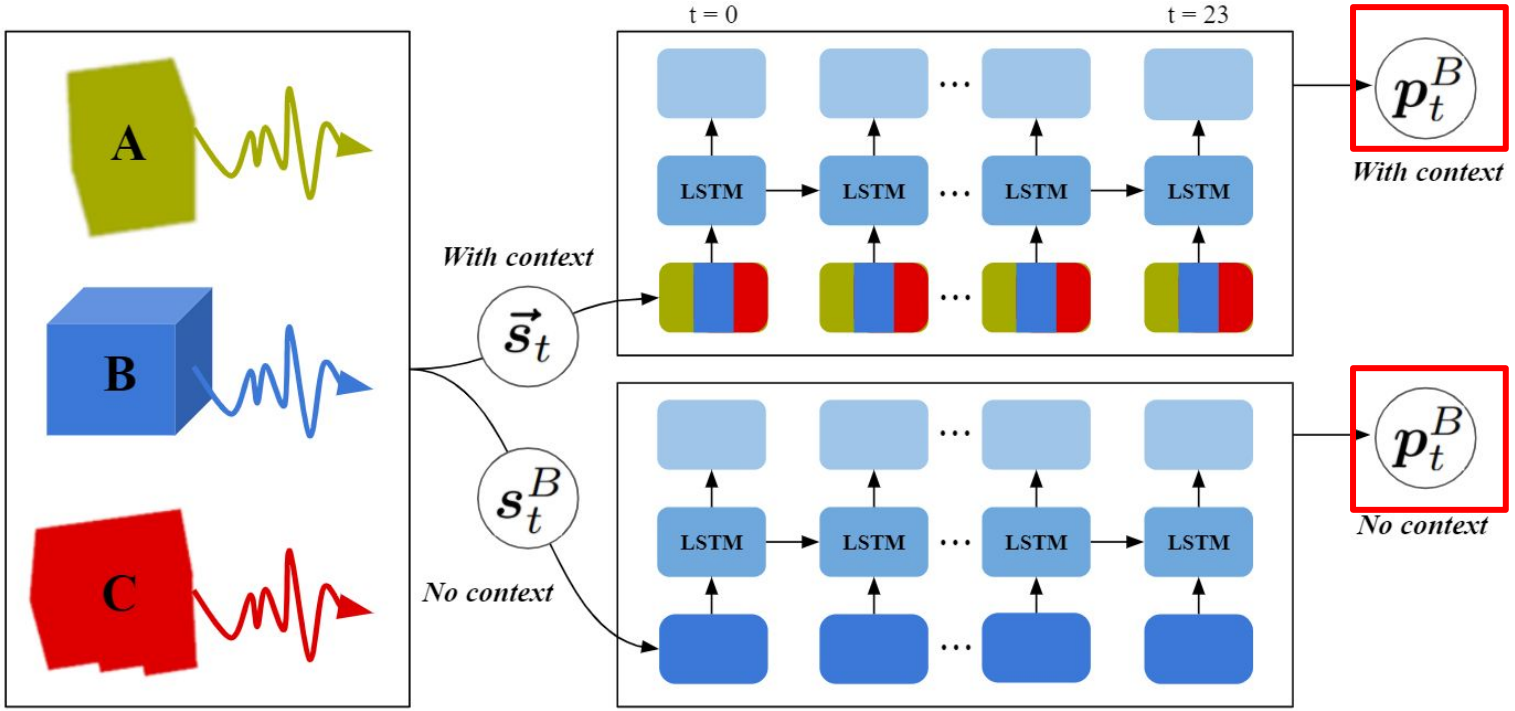
Methods



No context: one input building

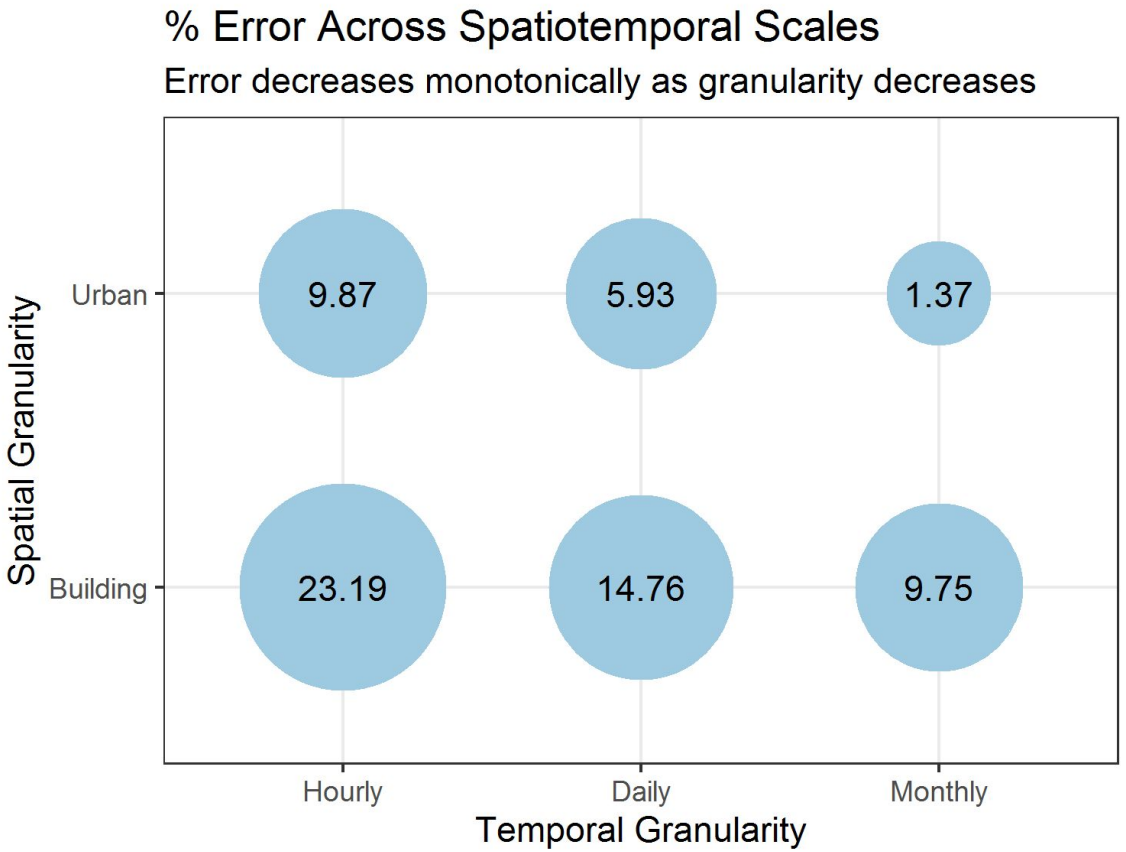
With context: all input buildings

Methods



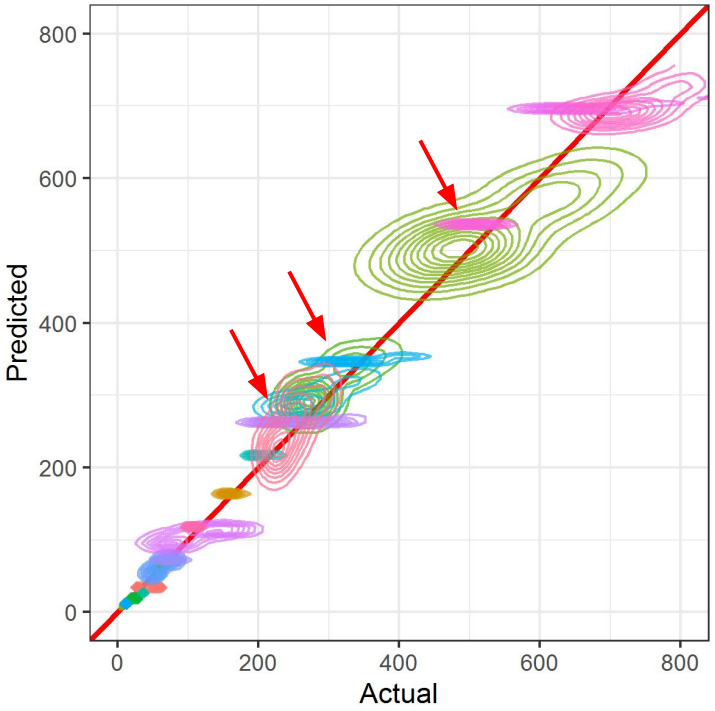
Predictions are made for one target building at a time in both methods

Results

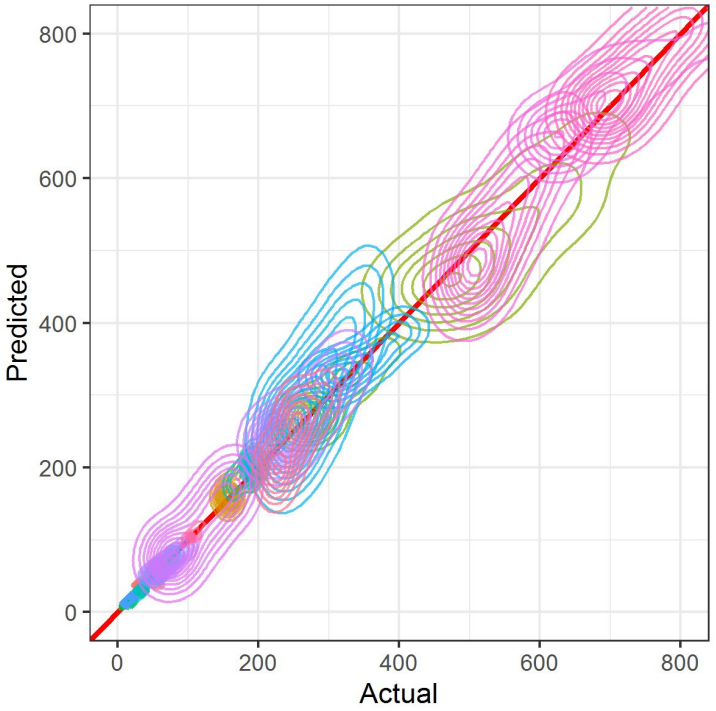


With context mean average percent error

Results

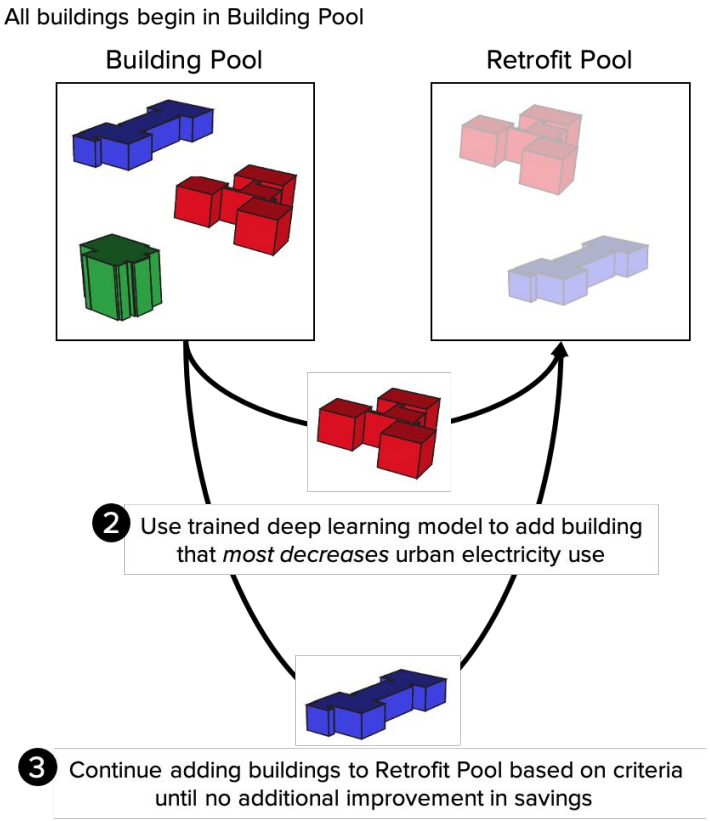


No Context Model



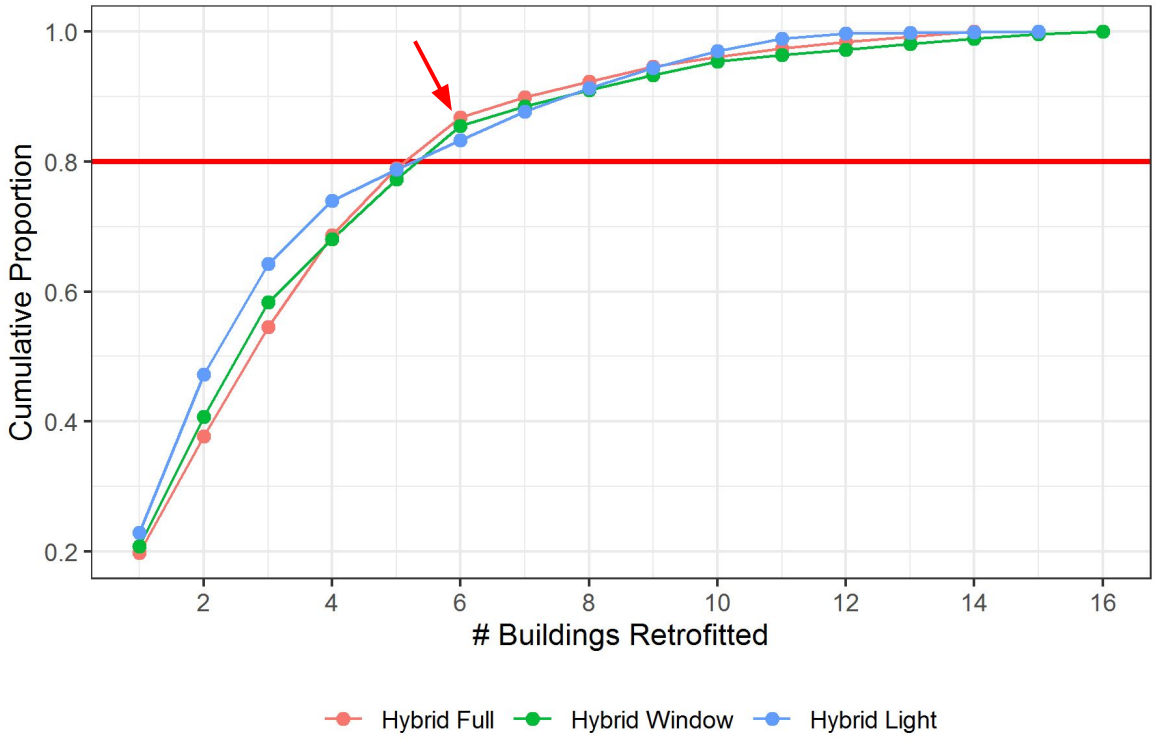
With Context Model

Applications



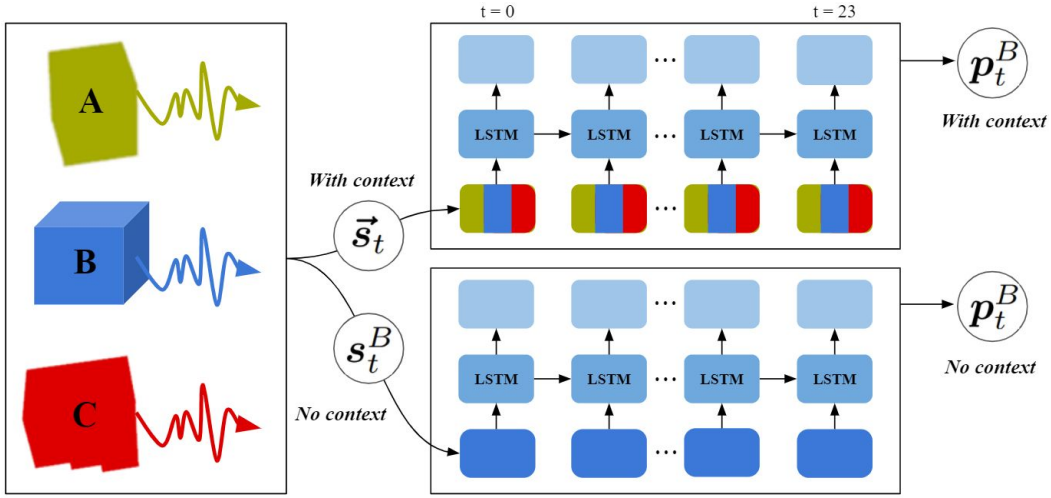
Greedy building selection method

Applications



80% of maximum potential savings with only 6 buildings

Next Steps



Conclusions

Hybrid modelling approach can assess the influence of urban context on retrofit efficacy

DUE-S can help inform urban energy decision making for variety of stakeholders

Future Work

Explore methods to better quantify the influence of specific inter-building effects

Integrate renewable energy generation (e.g., solar) into DUE-S modelling framework

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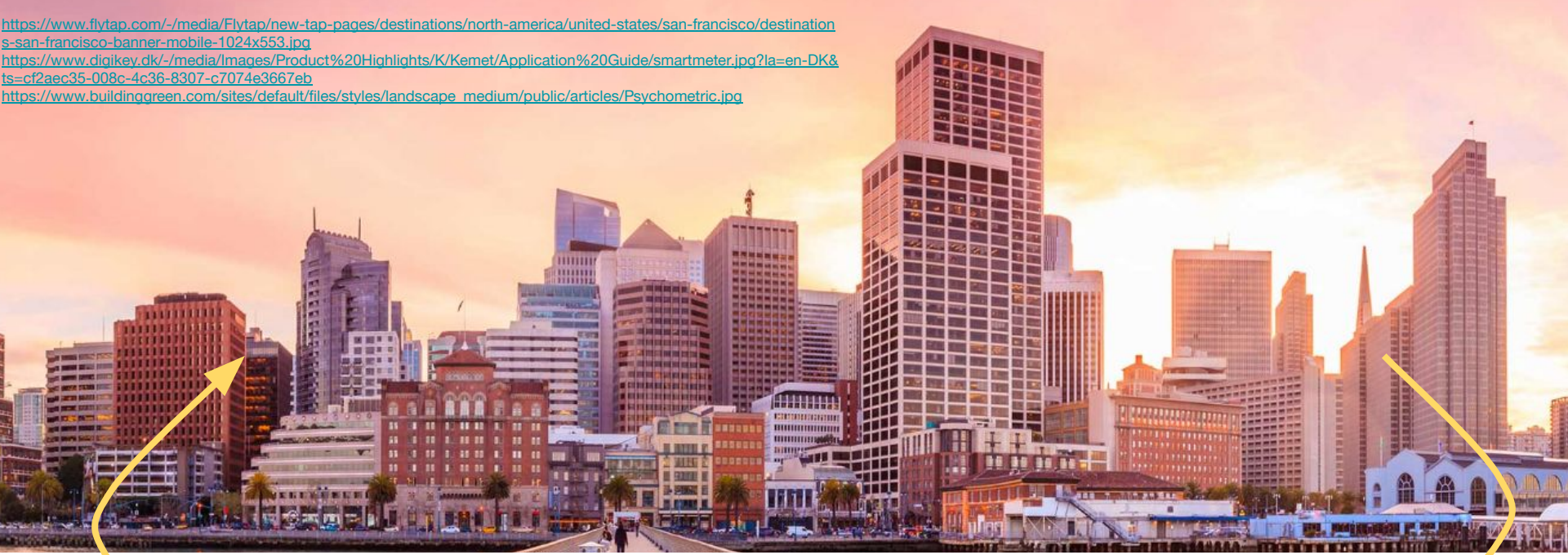
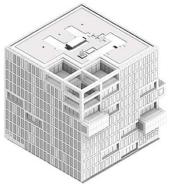
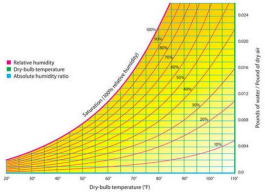


"Knowledge from Data"



Building Characteristics

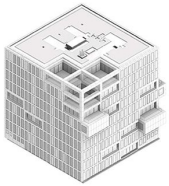


Weather Data

Smart Meters

"Knowledge from Building Physics"

“Knowledge from Data”



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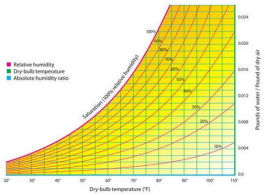

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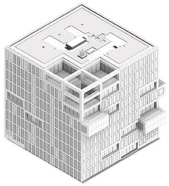

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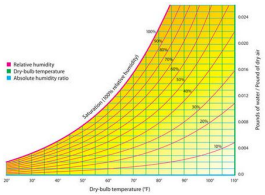

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