Here is an incomplete listing with rough summaries of all papers listed, and hyperlinks to locally stored copies of the papers in my myfiles directory. I make no claims of their utility, novelity and/or quality, rather they are intended to serve as a first step in a more thorough literature review. **There are also potentially relevant papers in the Journal of Building Performance Simulation, but RPI does not appear to have access.** Papers listed in alphabetical order by first author's last name. Links to PDF of paper stored in my RPI webfiles are shown in the reference.

[1] Aude in 2000 uses an adjoint-based approach to determine sensitivity of inputs and control parameters. Weather data here taken from a pylon on site that collected wind speed, temperature, etc. Able to isolate important inputs in their simulation of a building.

[2] Borchiellini uses Monte Carlo method for confidence intervals and fractional factorial analysis to determine relevant inputs for simulation of a detached house.

[3] Breesch and Janssens in 2010, *Sensitivity analysis was used to determine the most dominant set of input parameters causing the uncertainty on thermal comfort.* They use a synthetic set of weather data generated from 'Meteonorm' to replicate hourly weather data as their boundary conditions. Global sensistivity analysis, specifically Monte Carlo Analysis is used. C_p values are chosen using data fits, as simulation too expensive at the time.

[4] Brohus uses a stochastic differential equation as the method for measuring uncertainty and uses an analytic intrusive approach on the energy balance of a simplistic model. Classical numerical methods are then used to solve this stochastic system.
[5] Calleja outlines a strategy to do reduced-order modelling using the idea of macroparameters, and lumping smaller microparameters into macroparameters prior to doing uncertainty analysis.

[6] This is a thesis by Coakley in 2013, titled *Calibration of Detailed Building Energy Simulation Models using an Analytical Optimisation Approach.* I don't have time to go through it.

[7] This is a paper on Fault-Augmented Modelica models. While not directly applied to BIM, it introduces how to pass probability density functions into Modelica to account for failure in subsystems (ie material failure).

[8] De Wit and Augenbroe write a paper thats closer to a review paper, using expert opinion to comment on uncertainty on various aspects of building design, such as wind pressure.

[9] Ferreira uses neural networks to optimize control systems for temperature in a set of rooms of a house.

[10] Garcia uses the Morris method and the elementary effects method to analyse a building. A second-order analysis is performed, measuring the effects of relevant (uncertain) inputs on eachother.

[11] Heiselberg and friends use a simpler approach of one-at-time analysis of uncertainty to rank important parameters. They use probability density functions too, and speak a bit about how they come to their choices.

[12] Heo looks and model uncertainty, using *Bayesian calibration of normative energy models. Based on CEN-ISO standards, normative energy models are light-weight, quasi-steady state formulations of heat balance equations, which makes them appropriate for modeling large sets of buildings effi-*

ciently. They also speak of calibration of these models extensively and use them for some analysis of retrofitting of existing buildings for better energy efficiency.

[13] Hopfe uses uncertainty quantification for a 'what-if analysis', and looks at model robustness with respect to building performance parameters.

[14] Kim attempts to develop a software framework using Matlab's GUI to present an automatic stochastic approach to building design. Their goal is to provide a useful tool. Currently use Monte Carlo methods on a building to measure uncertainty in energy use.

[15] Lee and Georgia Tech introduce the Georgia Tech Uncertainty and Risk Analysis Workbench (GURA-W). Software option, potentially available.

[17, 16] MacDonald and Strachan implement Differential Sensitivity Analysis and Monte Carlo Analysis into ESP-r, a thermal analysis program.

[18] Mechri uses an ANOVA approach, which I've seen a lot in CFD. Don't know much about it, but its been tried for building design in this paper.

[19] Review paper on optimization of building design using simulation-based methods. Contains a lot of references.

[20] Optimal control of smart facades. Model is not too far off of our initial model. Designed to interact with real weather data.

[21] Passes in probability density functions in analysis of air infiltration in low-rise buildings.

[22] This is a relevant paper on resampling weather data for use in building simulations. This may be useful, and is fairly recent.

[23] Rezaee and others, something about confidence analysis of preliminary design of buildings with respect to energy models.

[24] Review paper on optimization of passive solar design strategies. 144 References.

[27] Some work by Sun on uncertainty quantification of the Perez Sky Model. Probabilistic approach.

[25] HVAC sizing under uncertainty.

[26] Relevant paper on uncertainty quantification for microclimate variables such as local temperature, wind speed, wind pressure and solar irradiation. Uses regression type uncertainty approaches, and does seem to examine the effect of varying model fidelity of weather data.

[28] Wei Tian, University of Cambridge. *A review of sensitivity analysis methods in building energy analysis.* Lots of references.

[29] This paper deals with *Stochastic Simulation and Inference using Modelica.* Describes their approach to passing uncertainty through Modelica, and applies it to underfloor heating optimization.

[30] Not really uncertainty quantification, but a study on the choice of coupling between CFD and Building Simulation, and the effects of various boundary condition approaches.

[31] Monte Carlo approach applied to *Identification of the building parameters that influence heating and cooling energy loads for apartment buildings in hot-humid climates.*

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