SAA formulation with shape constraints

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$$\begin{aligned} \min_{\{h(t),s(t)\}} \mathbb{E}[Y(h,s)] &= \frac{1}{N}\sum_{i=1}^{N} y_i(h,s) \\ \text{s.t. } h(t) &= \{h_t\}_{t=1,\dots,T} \in \Omega_H \\ s(t) &= \{s_t\}_{t=1,\dots,T} \in \Omega_S \end{aligned}$$

- $h(t)$ and $s(t)$ are build functions for housing and shelter, respectively.
- h_t is the number of housing units to be built in year t
- s_t is the number of shelter units to be built in year t
- $y_i(h,t)$ is a functional whose output is the observed system response at the ith iteration, given build functions h and s.
- $Y(h,t)$ is a functional defining the random, unknown system response
- T is the decision horizon, in years
- N is the simulation budget for each feasible pair of build functions $\{h(t), s(t)\}$
- Ω_h and Ω_s are sets of feasible build functions, which capture the desired shape constraints.