AEC TECH + BARCELONA

SAUSAGE DOG

APP FOR A SIMPLIFIED OPTIMIZATION WORKFLOW

our 25-hour goal:

extending the Shapediver frontend with a multi-objective genetic algorithm (NSGA-II)

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UX mock-up

Parameters

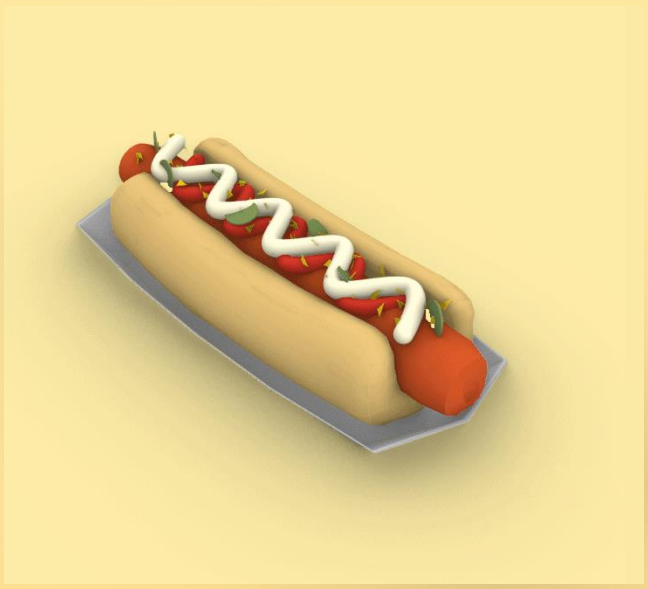
- [x] sausageChoice
- [x] sauceChoice1
- [ ] sauceChoice2
- [x] toppingChoice1
- [x] toppingChoice2
- [ ] bunChoice

Optimize

- [x] Health: 0.25
- [x] Taste: 0.75
- [ ] Cost

Optimize

Optimal hotdog preview

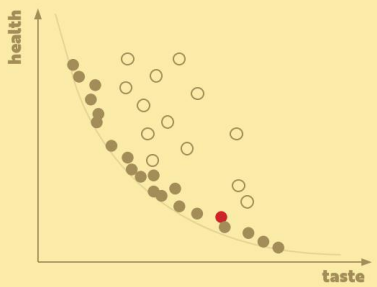


Searching best solution..

Recipe

- meat sausauge: 0.91
- mayonaise: 0.76
- ketchup: 0.97
- pickles: 0.42
- cheddar cheese: 1.0
- regular bun: 0.5

Output



VALUE PROPOSITION:

CREATE A LOW SKILL

OPTIMIZATION ENVIRONMENT

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Parameters

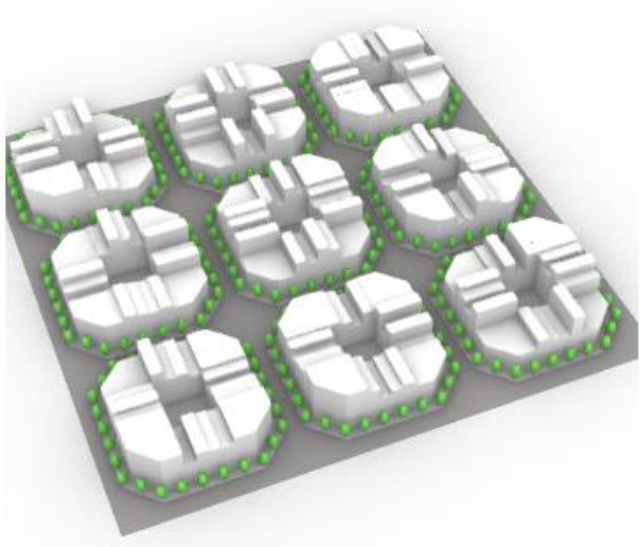
- [x] blockDimensions
- [x] courtyardDimensions
- [ ] cornerCuts
- [x] buildingHeight

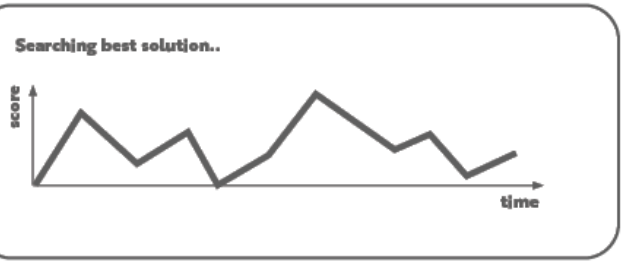
Optimize

- [x] courtyardArea: 0.17
- [x] buildingVolume: 0.65

Optimize

Optimal solution preview

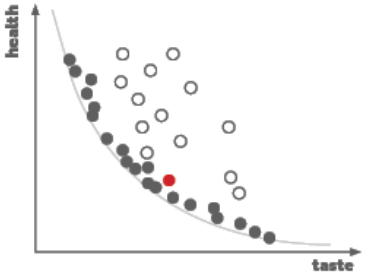




Best result

- blockDimensions: 0.91
- courtyardDimensions: 0.76
- cornerCuts: 0.97
- buildingHeight: 0.42

Output



WITH NO CODING THE END-USERS CAN:

IMPROVE WORKFLOWS

GET QUICKER CLIENT DECISIONS

DESIGN OPTIMIZATION

BUILDING SIMULATIONS

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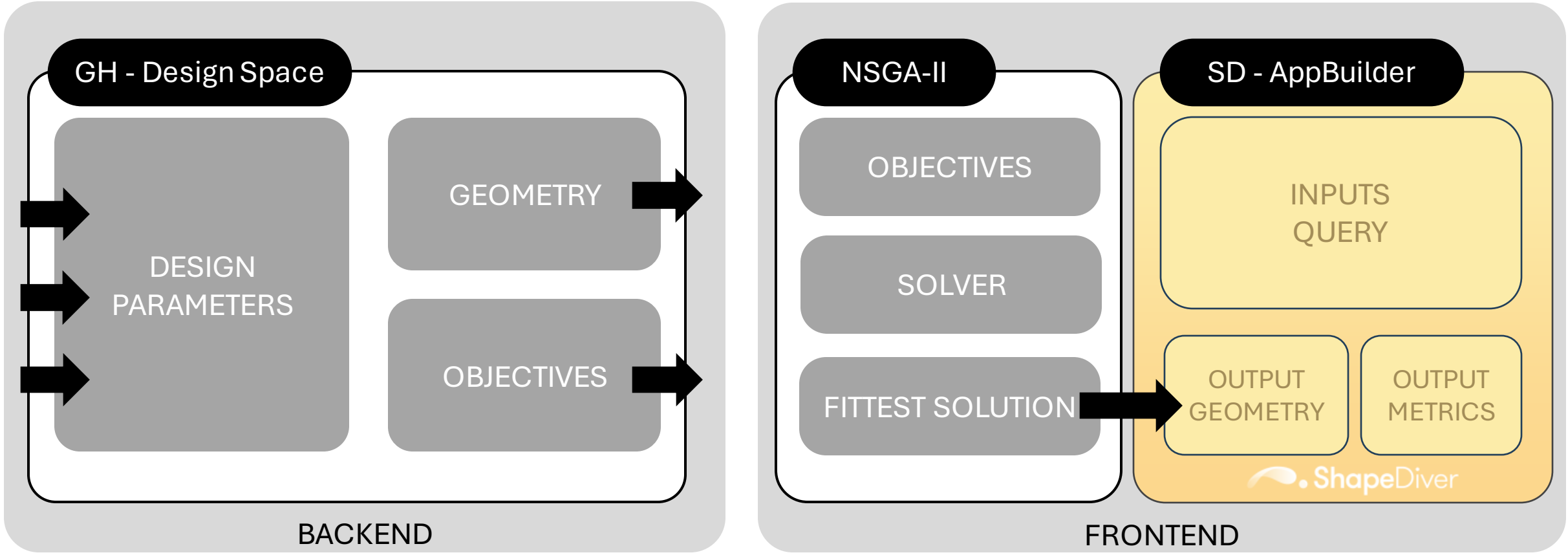
From Complexity to simplicity >> No need to look for the needle in the haystack



HIGH skill set environments | **LOW skill set environment**

Keep the Design Space clean!

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INGREDIENTS

Frontend
Human UI : Input Panel

Simplified Inputs
(Weights)

OBJECTIVE 1

OBJECTIVE 2

OBJECTIVE 3

ShapeDiver

Frontend

Non dominated Sorting Genetic Algorithm

NSGA-II

population of solutions

"fittest solution"

Backend
GH Model

OBJECTIVES

Design Parameters

Geometry

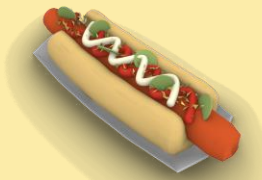
Metrics

Server

RECIPE

Frontend
Human UI Output Panel

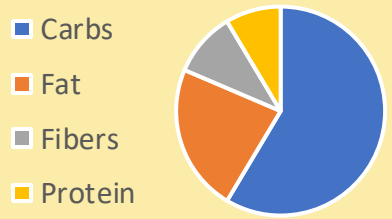
Visualization Module



Metrics Module

Actual cost

Deliciousness



ShapeDiver

Added value of the hack:

Ability to plug-in a complex models to a solver with a simple UI

NO-CODE aspect

What has been done:

Integration of an external NSGA-II library into the Shapediver

Connection to the Design Space I/O > New Component Prototzpe

Created 2 sample files > uploaded in the repository

LINK TO THE APP:

Challenges:

Define the workflow logic

Gettning the solver connected dynamically to the GH-models