Parameter Spaces

Tuner: Principled Parameter Finding for Image Segmentation Algorithms Using Visual Response Surface Exploration

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Motivation

- Image Segmentation
  - Manual vs. Automatic
  - Generic solution?
- Input Parameters
- Input Data

Tuner

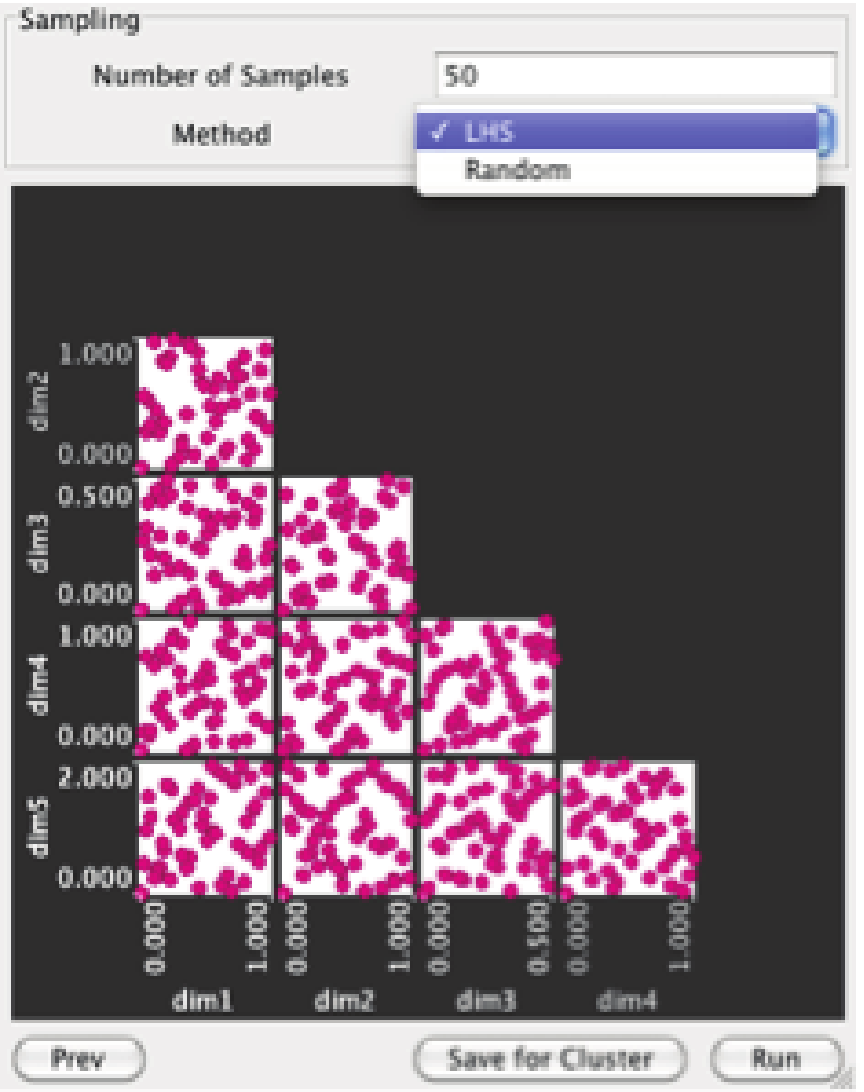
- Independent from the segmentation Algorithm
- Explore the full parameter space
- Find optimal parameter setting
- Slice based Navigation
- More

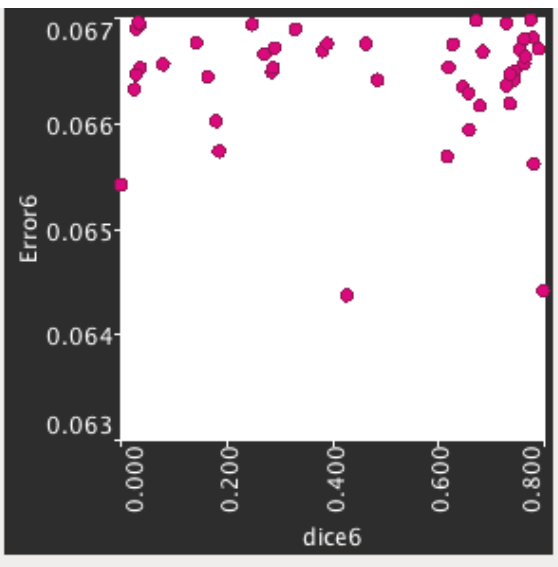
Tuner – Idea

- Generate good parameter settings
  - Sparse sampling
  - Applying statistical model
- User selects one of them (at a time)
- And refine it with user input

Tuner – Model

- Algorithmic Parameters
- Model Parameters
- Tuning parameters
- Optimization





View

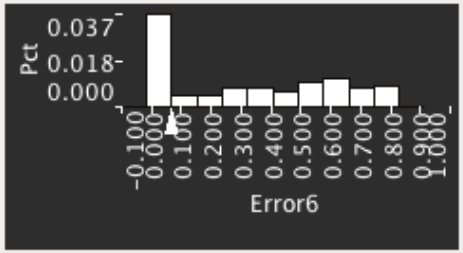
Value Error Gain

Glyphs

Region Line to Sample

Response Histograms

Error6



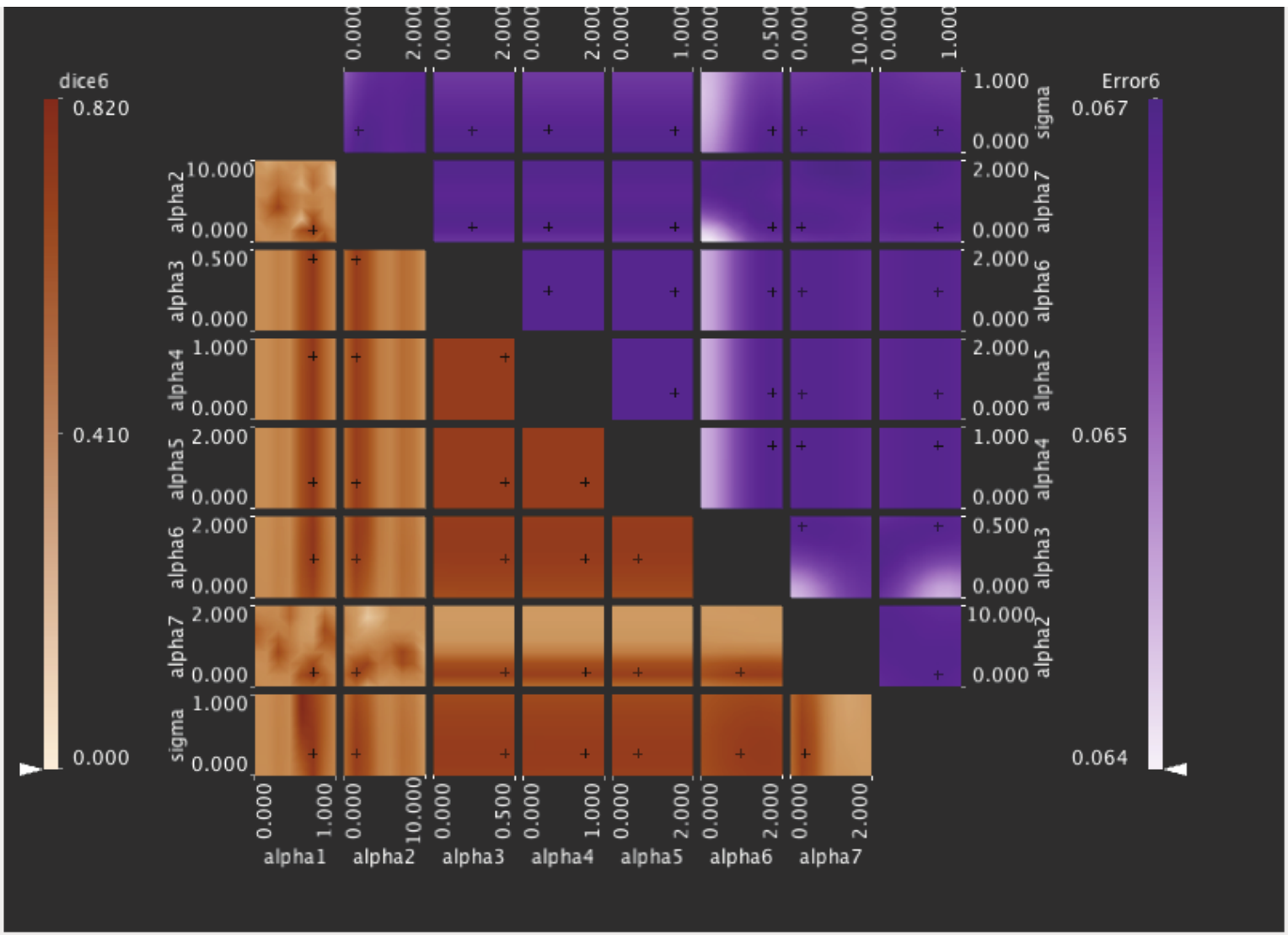
dice2

dice3

dice4

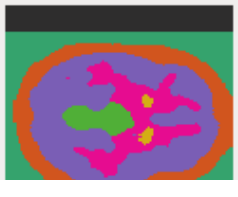
dice5

dice6



Info Local Controls History

	alpha1	alpha2	alpha3	alpha4	alpha5	alpha6	alpha7	sigma	Error2	E
Estimate	0.723	1.43	0.439	0.775	0.64	0.962	0.364	0.272	0.002	
Nearest Sample	0.653	1.414	0.36	0.134	0.745	1.144	0.217	0.131	0.004	



Video?

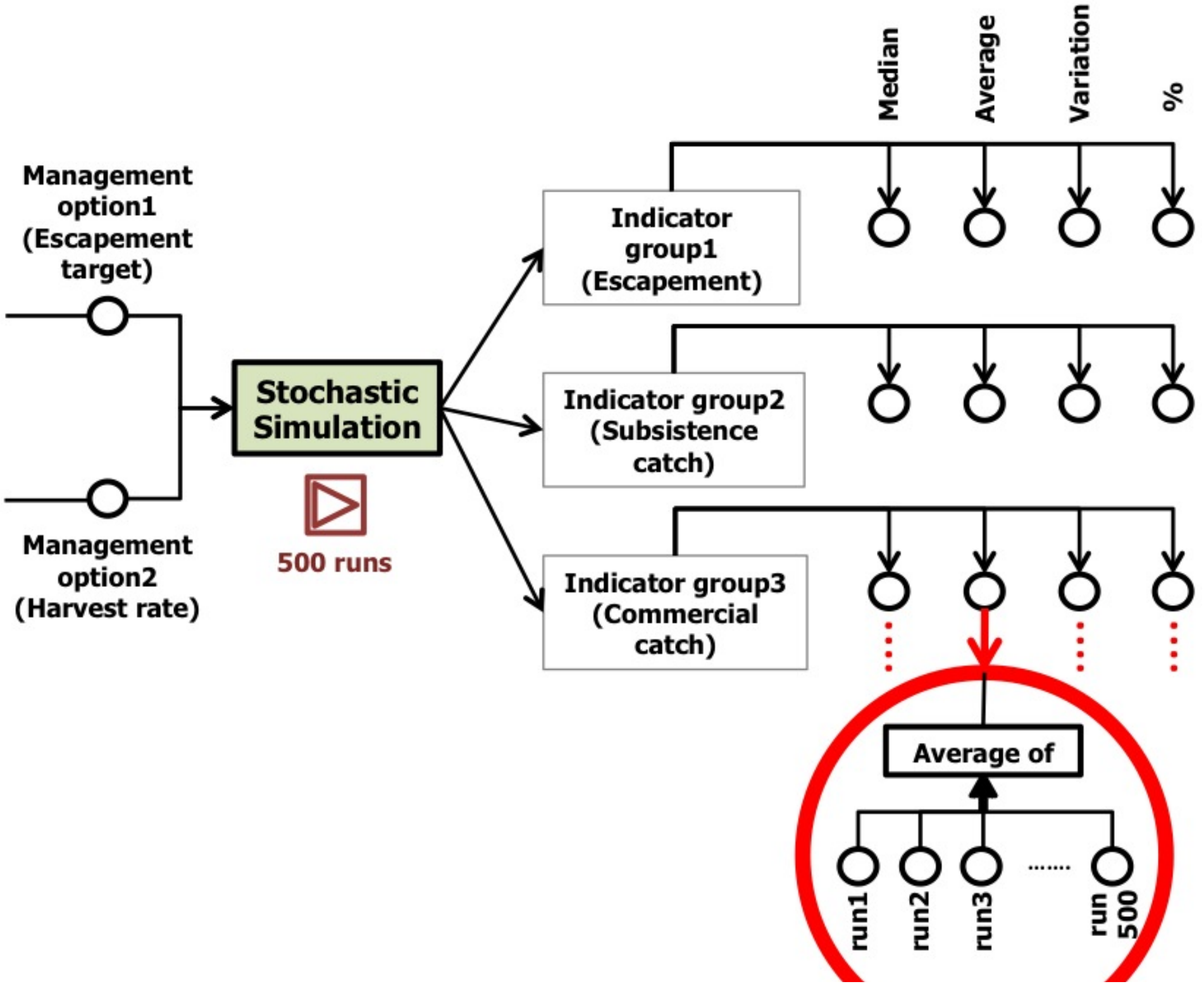
Parameter Spaces

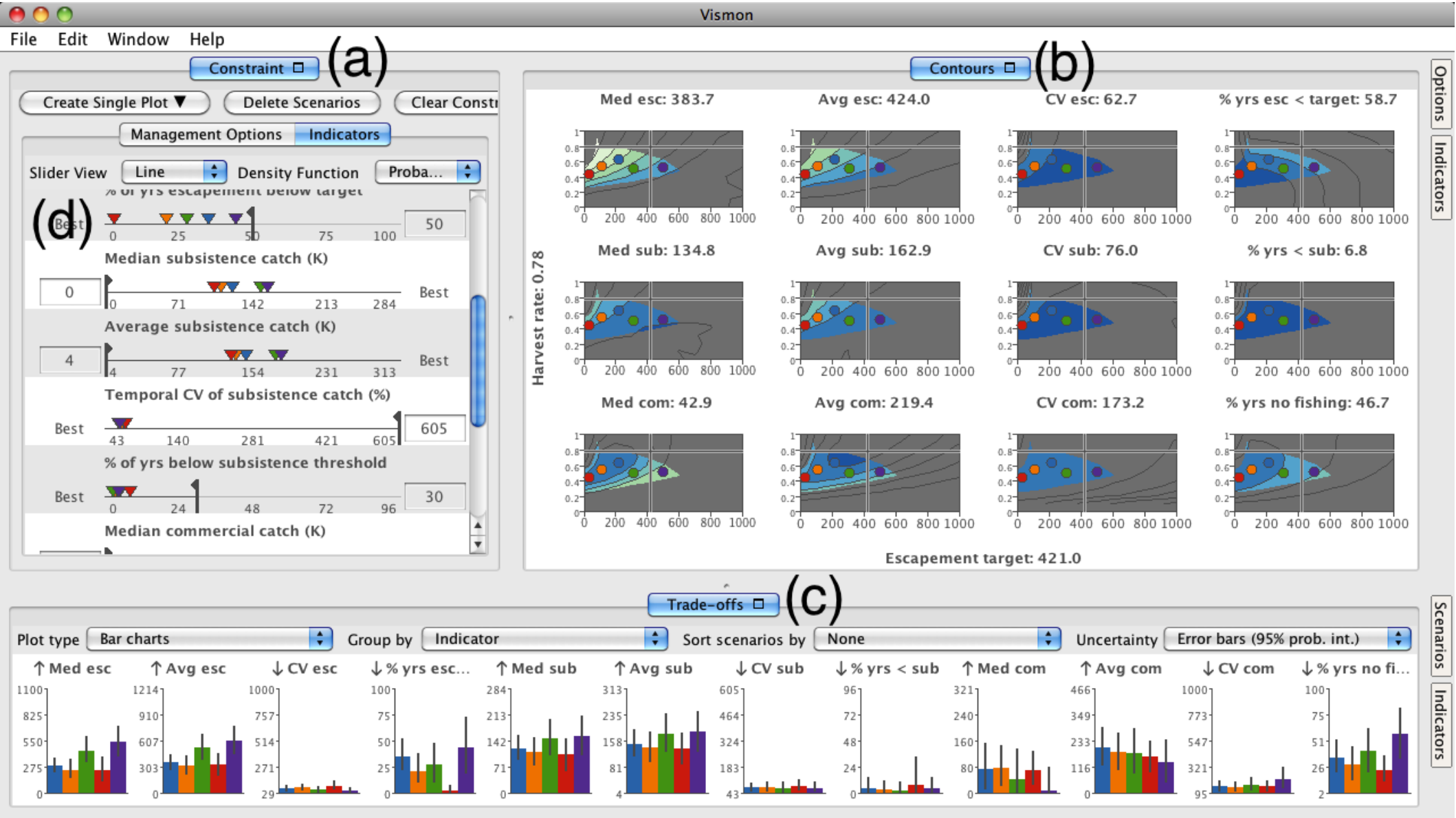
Vismon: Facilitating Analysis of Trade-Offs, Uncertainty, and Sensitivity In Fisheries Management Decision Making

Maryam Booshehrian, Torsten Möller, Randall M. Peterman, Tamara Munzner

Vismon – Into

- Data analysis of simulation (Fish population)
  - Sensitivity (avoid)
  - Constraint-based
  - Trade-offs
  - Uncertainty (avoid)


Median
Average
Variation
%
Management option1 (Escapement target)
Management option2 (Harvest rate)
Stochastic Simulation
500 runs
Indicator group1 (Escapement)
Indicator group2 (Subsistence catch)
Indicator group3 (Commercial catch)
Average of
run1
run2
run3
.....
run 500


Vismon
File
Edit
Window
Help
(a)
Constraint
Create Single Plot
Delete Scenarios
Clear Constr
Management Options
Indicators
Slider View
Line
Density Function
Proba...
(d)
% of yrs escapement below target
Best
0
25
50
75
100
50
Median subsistence catch (K)
0
0
71
142
213
284
Best
Average subsistence catch (K)
4
4
77
154
231
313
Best
Temporal CV of subsistence catch (%)
Best
43
140
281
421
605
605
% of yrs below subsistence threshold
Best
0
24
48
72
96
30
Median commercial catch (K)
(b)
Contours
Med esc: 383.7
Avg esc: 424.0
CV esc: 62.7
% yrs esc < target: 58.7
Med sub: 134.8
Avg sub: 162.9
CV sub: 76.0
% yrs < sub: 6.8
Med com: 42.9
Avg com: 219.4
CV com: 173.2
% yrs no fishing: 46.7
Harvest rate: 0.78
Escapement target: 421.0
(c)
Trade-offs
Plot type
Bar charts
Group by
Indicator
Sort scenarios by
None
Uncertainty
Error bars (95% prob. int.)
↑ Med esc
↑ Avg esc
↓ CV esc
↓ % yrs esc...
↑ Med sub
↑ Avg sub
↓ CV sub
↓ % yrs < sub
↑ Med com
↑ Avg com
↓ CV com
↓ % yrs no fi...
Options
Indicators
Scenarios
Indicators