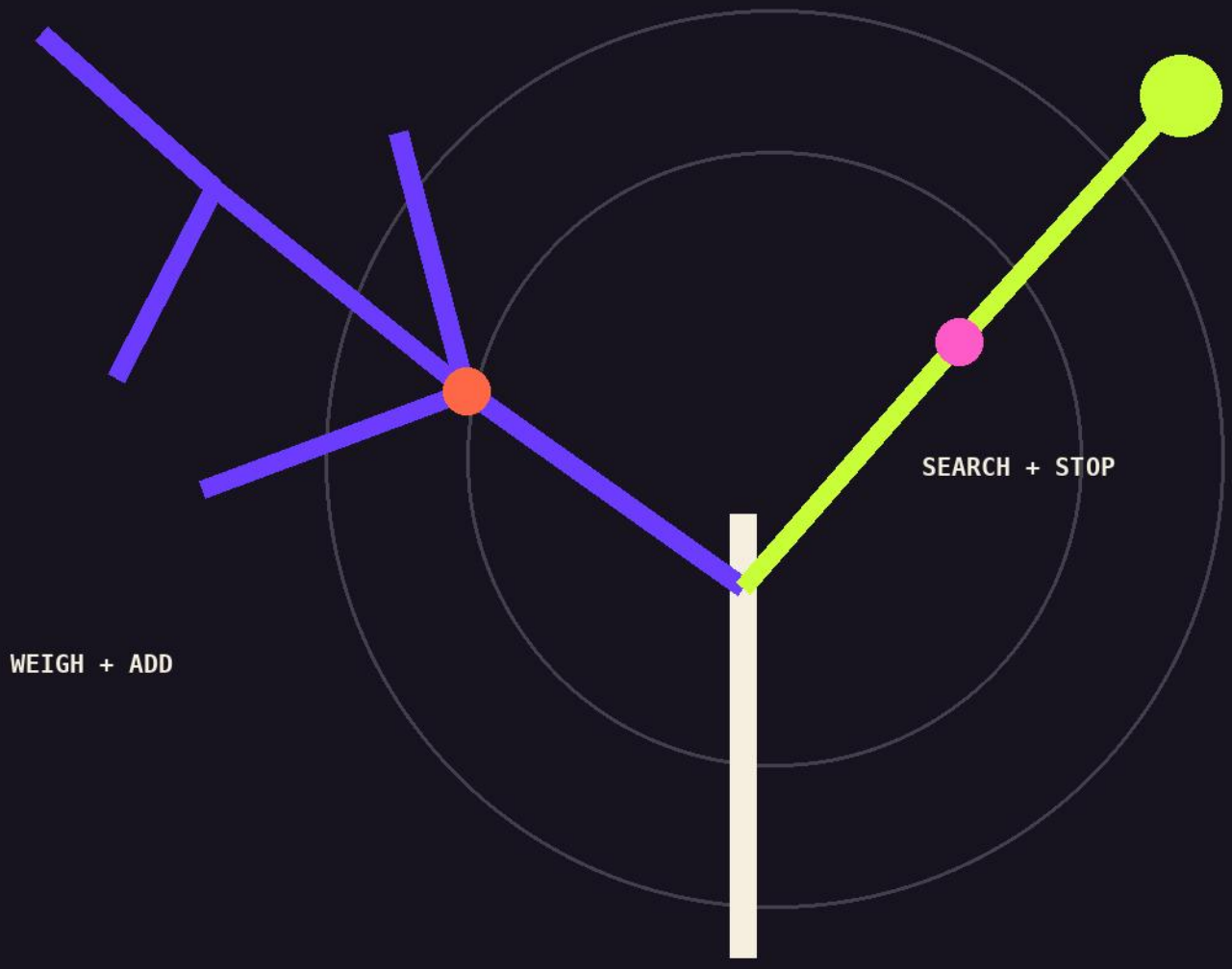
FIELD GUIDE 01 / BOUNDED MINDS, BRANCHING WORLDS

Paths through bounded rationality

A practical guide to decision trees, satisficing, cue order, stopping rules and the ethics of making a clean cut through an uncertain world.



decisionforest.sahilwho.online
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START HERE

A tree is a procedure, not a mind

A decision tree makes a route inspectable: ask a question, follow a branch, reach a leaf. Bounded rationality asks why real choosers rarely inspect the whole forest - and how limited time, information, attention and computation become part of the explanation.

ESTABLISHED

Bounded rationality

Herbert Simon challenged models that assume a chooser knows every option and consequence and can optimise without search cost. The procedure and environment jointly shape what is possible.

ESTABLISHED

Satisficing

Search stops when an option clears an aspiration level. Good enough can be demanding. Quality depends on the threshold, search order and the cost of a missed alternative.

TWO MEANINGS

Decision tree

A designed aid can encode expert if-then questions. A machine-learning tree fits splits from examples. Both are explicit; neither is automatically accurate, fair or causal.

THE CAUSAL MODEL IN THE EXHIBIT

01 **Attention selects cues.**
Uninspected information cannot affect the displayed result.

02 **A rule integrates them.**
One rule weights and adds; the other searches in sequence and stops.

03 **Order meets threshold.**
A shortcut may exit before contradictory evidence becomes visible.

04 **An output follows.**
The result comes from ratings, weights, order and threshold - not a hidden profile.

BRANCHING CHOICE FOREST

Run two rules over one fictional choice

One small grant can fund Banyan Canopy, fixed shade at a busy square, or Lichen Library, portable shade kits loaned locally. Every 0-10 rating below is invented to make rule behaviour visible. It is not a research finding.

CUE	BANYAN A	LICHEN B	GAP
People reached	9	6	A +3
Reversibility	4	9	B +5
Evidence fit	7	6	A +1
Low community burden	5	8	B +3

1. Set an attention budget from one to four cues: _____ cues.
2. Choose an inspection order: 1. _____ 2. _____ 3. _____ 4. _____
3. Set the shortcut's stopping gap from one to five points: _____ points.
4. Choose weights: balanced (all 1); guardrail (.6, 1.6, .8, 1.5); reach (1.7, .6, 1.3, .6).

RULE A / WEIGH + ADD

For each inspected cue, multiply each pilot rating by the chosen lens weight, then add the products. Higher total is the illustrative recommendation. Uninspected cues contribute zero.

A total: _____ **B total:** _____ **Exit:** _____

RULE B / SEARCH + STOP

Read cues in your order. Stop at the first absolute gap meeting the threshold. That cue's leader wins; later cues are ignored. If none qualifies, the rule has no exit.

Exit: _____ **Cues used:** _____

A DISAGREEMENT WORTH KEEPING

Are shortcuts errors - or adaptations?

PERSPECTIVE A

Error and bias

The heuristics-and-biases programme associated with Amos Tversky and Daniel Kahneman documents systematic departures from normative benchmarks. Availability can make vivid events seem more frequent; anchoring can give an arbitrary starting value too much pull. From this lens, stopping early is risky because ignored base rates or probabilities may matter. Its strength is diagnostic precision: specify the benchmark and repeated error. Its limit is transfer. A laboratory task may not reproduce a skilled person's feedback-rich environment.

PERSPECTIVE B

Ecological fit

Fast-and-frugal research asks when a simple rule fits an environment. With small samples, unstable relationships or expensive information, estimating many weights can fit noise. A one-reason rule may be robust, communicable and auditable. Its strength is taking uncertainty and search cost seriously. Its limit is easy overreach. Less can be more is an empirical hypothesis for a defined task, environment and comparison - not permission to discard inconvenient evidence.

Ask what counts as success before asking which rule wins: logical consistency, calibrated probability, fewer false negatives, speed, accountability - or a negotiated combination?

THREE DISTINCTIONS

Risk is not uncertainty	Known probabilities permit different tools from novel, shifting situations.
Description is not prescription	How people choose does not automatically tell an institution how it ought to decide.
Prediction is not explanation	A split can predict an outcome without identifying what causes it.

TWO INSTITUTIONAL CLEARINGS

Simple paths in real settings

CASE 01 / 1997

Rural hospital

Chest-pain triage changed after cue attention changed

Lee Green and David Mehr studied placement of patients with suspected acute cardiac ischaemia in a coronary care unit or monitored nursing bed at a 100-bed rural hospital. Residents received probability charts from a Heart Disease Predictive Instrument during alternating weeks. The trial-year analysis included 89 patients, with earlier and later comparison periods. Card use did not change utilisation during the intervention. Utilisation had already fallen after a conference explained the instrument. The authors proposed that attention to relevant factors may have changed before explicit probability calculation did. Limit: a small, single-service study with timing that complicated the planned trial. It does not justify replacing validated contemporary protocols.

CASE 02 / 2014

Bank regulation

A sparse tree competed with richer failure models

A Bank of England Financial Stability Paper by David Aikman and colleagues examined simplicity versus complexity. In its global-financial-crisis analysis, some simple indicators outperformed more complex risk-weighted metrics, and fast-and-frugal trees performed comparably to more information-intensive regression approaches. The proposed advantage involved limited data, fat-tailed risks, overfitting and communication. A sparse rule estimates fewer relationships and makes alert logic inspectable. Limit: historical crisis performance is not a timeless regulatory recipe. The work was policy analysis, not a randomised intervention, and simple rules can miss novel failure modes.

Sources: Green and Mehr (1997), PMID 9300001; Aikman et al. (2014), Bank of England FSP 28.

PRUNE THE FOLKLORE

Four myths, then six safeguards

MYTH

More information always improves a choice.

Information helps when relevant, reliable and integrated without excessive cost or overfitting. Sometimes more cues add signal; sometimes noise.

MYTH

A visible tree is objective.

People choose the target, data, cue order, thresholds and error costs. Visibility enables critique; it does not remove values.

MYTH

Satisficing means accepting a poor result.

It means stopping at an aspiration level. Whether that level is defensible depends on stakes, alternatives and search cost.

MYTH

Simple rules are naturally fair.

A simple rule can aid audit, but one discriminatory cue can reproduce harm with great efficiency.

A SIX-QUESTION TREE AUDIT

1. What decision is the tree allowed to make?
2. Who bears false-positive and false-negative costs?
3. Which relevant cues are unavailable or excluded?
4. Was performance tested on new, representative cases?
5. Can an affected person challenge both data and rule?
6. What event triggers review or retirement?

ETHICAL LIMIT

Do not use a teaching tree as a diagnostic instrument. In health, hiring, credit, education or public benefits, require domain validation, subgroup error analysis, documentation, monitoring and meaningful appeal. A human reviewer is not a safeguard if they only rubber-stamp the output.

A 12-MINUTE FIELD EXERCISE

Map a decision you actually face

01 **Name the decision without hiding a conclusion.**

Write choose a transport plan for six months, not justify buying a car.

02 **Separate options, cues and outcomes.**

An option is what you can do; a cue is evidence available now; an outcome arrives later.

03 **Set one non-negotiable guardrail.**

Identify a threshold that protects against unacceptable harm. Record who defined it.

04 **Write two rival procedures.**

One weighs several cues. One checks cues in order and stops. Where might they disagree?

05 **Price one more branch.**

What would added information cost in time, money or delay? Which error might it prevent?

06 **Schedule a review.**

What evidence would make you revise the rule instead of defending the result?

FINAL PROMPT

Which limit is shaping this choice - missing information, limited attention, irreducible uncertainty, or an institutional deadline?

Debrief: if the rival procedures disagree, do not average them automatically. Locate the branch responsible. Is it a value weight, missing cue, stopping threshold or difference in error costs? That point is a useful target for research or conversation.

KEEP CLAIMS SMALLER THAN EVIDENCE

What this guide does not prove

Your route through the print experiment does not measure rationality, intelligence, personality, values or decision skill. A changed output does not prove one strategy universally superior. Ratings, weights and stopping rules are fictional and unvalidated.

The exercise demonstrates a conceptual dependency: when attention, cue order, weights or thresholds change, a transparent procedure can change its result. Real transfer requires local evidence, explicit error costs and domain review.

FIELD QUESTIONS TO KEEP

What was never searched?

An absent branch can matter as much as a visible one. Record which options and cues were outside the frame.

Who set good enough?

A threshold can protect against harm or conceal low ambition. Its author and revision rule belong in the record.

What kind of uncertainty?

Noise around a stable probability differs from novelty that makes past frequencies unreliable.

What would reverse the exit?

Test sensitivity to order, threshold, weights and a plausible new cue before treating a result as robust.

A COMPACT DEPLOYMENT RULE

Use the simplest procedure that survives relevant out-of-sample comparison, exposes its error costs, remains contestable and can be retired when its environment changes.

This is a governance principle, not a theorem. Simplest is relative to the task; relevant demands a deployment-specific comparison.

VERIFIED READING TRAIL

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