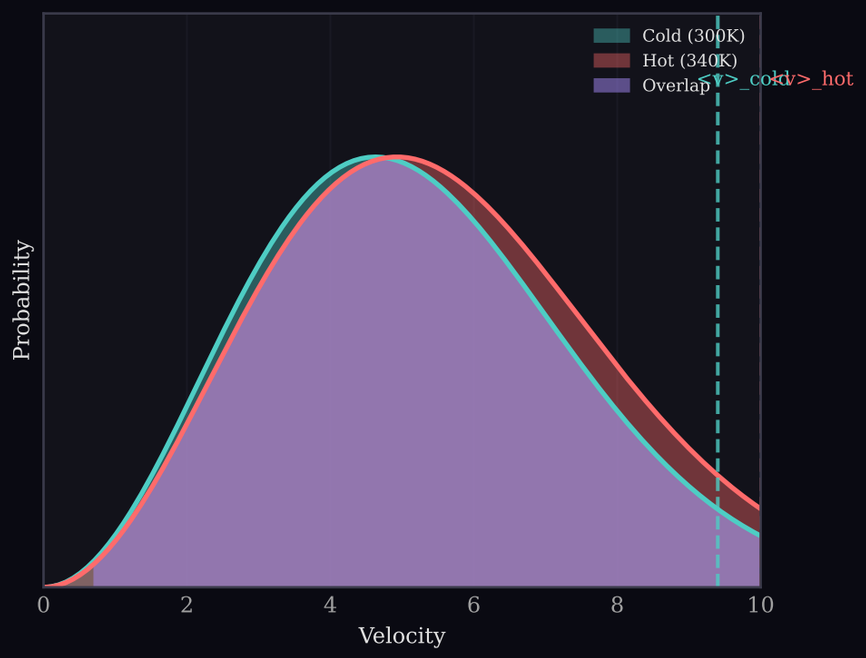
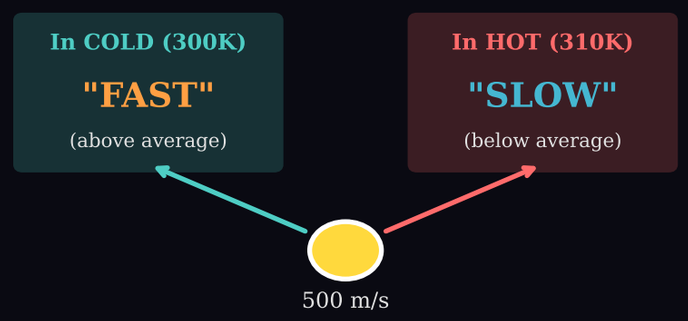
Velocity-Temperature Non-Correspondence: Same Velocity, Different "Temperature Meaning"

A. Overlapping Distributions

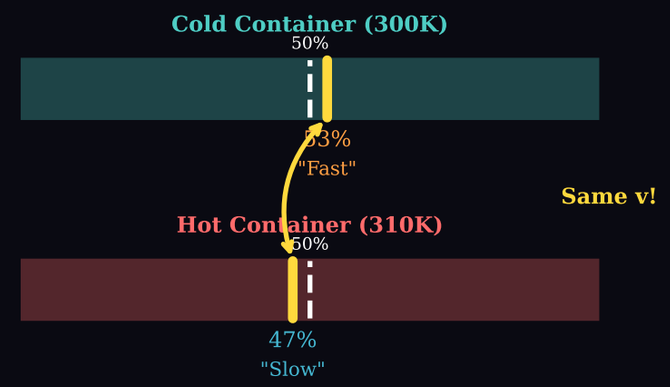


B. Same Velocity, Different Meaning

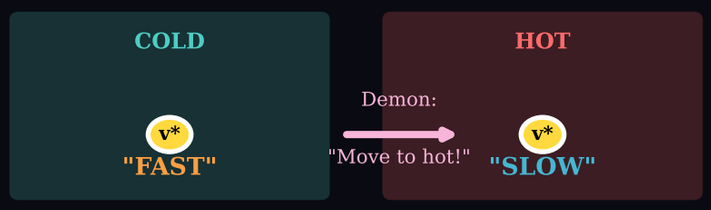


Same velocity, opposite categorical meaning!

C. Velocity Percentile by Context



D. Sorting Paradox



PARADOX:

Intended: Add "fast" to make hotter

Result: Added "slow" - makes COLDER!

Demon achieved the OPPOSITE

E. No Molecular Temperature

WRONG

Molecule has v

->

Molecule has T

CORRECT

Ensemble has {v_i}

->

Ensemble has T

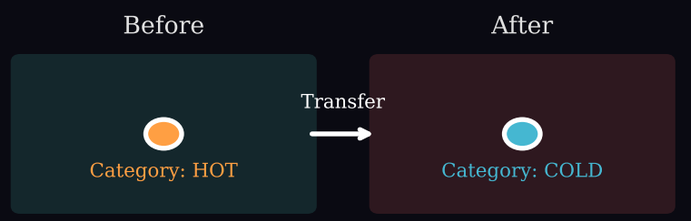
T = T[{v_1, v_2, ..., v_N}]

Temperature is a FUNCTIONAL of distribution

NOT a function of individual velocity

Only ENSEMBLES have temperature

F. Category Changes on Transfer



Velocity: UNCHANGED

Category: INVERTED

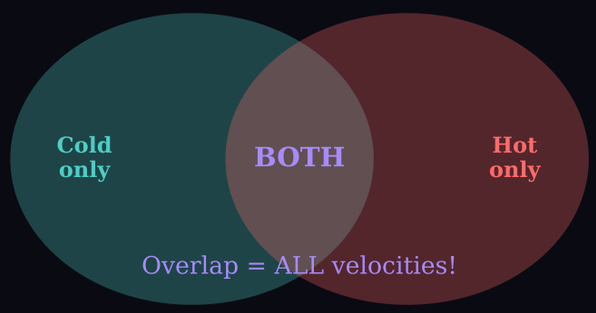
Context determines meaning

G. Why Demon Cannot Sort by T

1. Temperature is not a molecular property
2. Velocity does not determine T contribution
3. T contribution is ensemble-relative
4. Transfer changes categorical meaning

Sorting by velocity =/= sorting by temperature

H. Overlap Region Problem



Every velocity exists in both distributions

The overlap is COMPLETE

I. The Insight

Velocity =/= Temperature

Same velocity v:

In cold: "FAST" (contributes to hotness)

In hot: "SLOW" (contributes to coldness)

The demon sorts by velocity

but CANNOT sort by temperature

Temperature is contextual, not intrinsic