PAC LEARNING *&* OCCAM'S RAZOR
PROBABLY APPROXIMATELY INCORRECT

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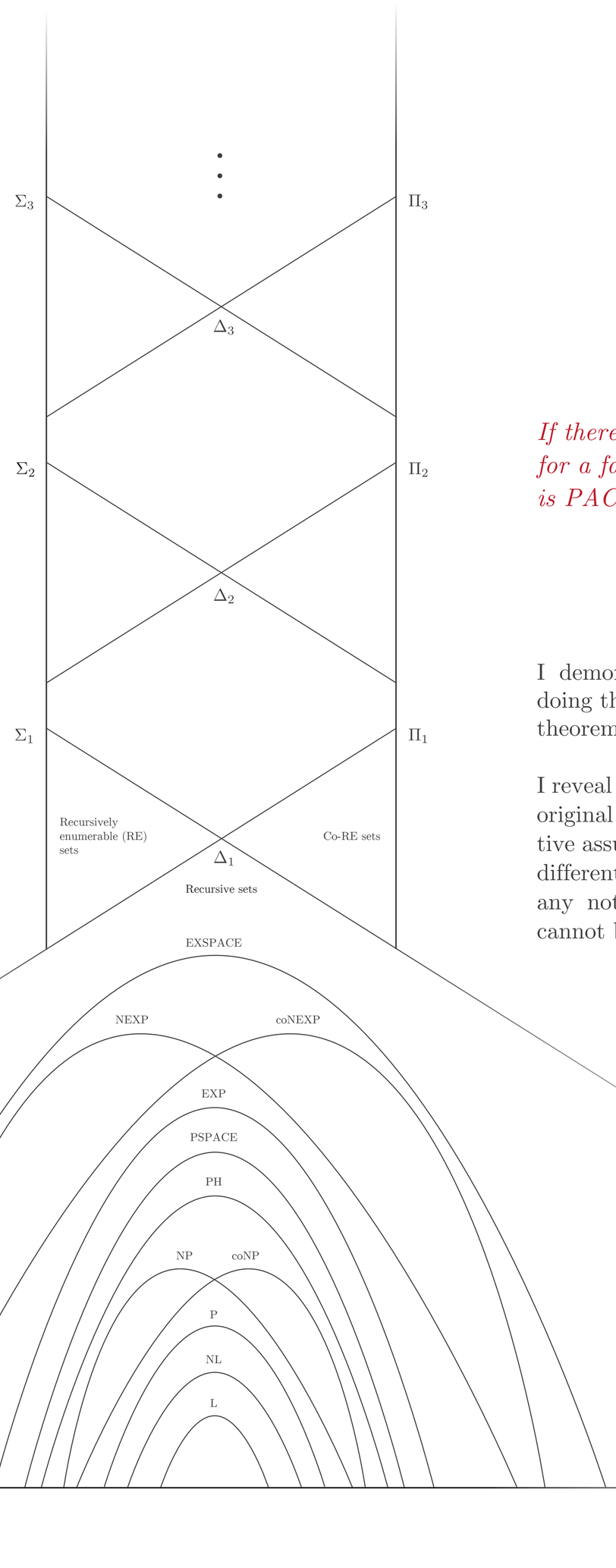
BACKGROUND

Computer scientists have provided a distinct justification of Occam's Razor. Within the context of the probably approximately correct framework, Blumer et al. (1987) prove the theorem below.

They claim the theorem demonstrates that we should favour simpler hypotheses in our inquiry, and thus that they have vindicated Occam's Razor.

OCCAM THEOREM

If there exists an Occam algorithm $\mathcal{O}$ for a family $\mathcal{H}$ of hypothesis spaces, then $\mathcal{H}$ is PAC-learnable.



ANTI-OCCAM THEOREM

If there exists an Anti-Occam algorithm $\mathcal{A}$ for a family $\mathcal{H}$ of hypothesis spaces, then $\mathcal{H}$ is PAC-learnable.

RESULT & MORAL

I demonstrate that simplicity is not what is doing the work. My point is driven home by the theorem above.

I reveal that what is really doing the work in the original Occam Theorem are additional inductive assumptions. With such assumptions, many different methods can learn without relying on any notions of simplicity. Thus, the theorem cannot be a justification of Occam's Razor.

RFERENCES

Blumer, A., Ehrenfeucht, A., Haussler, D., and M. K. Warmuth. 1987. "Occam's razor." *Information processing letters.* 24 (6): 377–380.

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