Fairness-Aware Structured Pruning in Transformers

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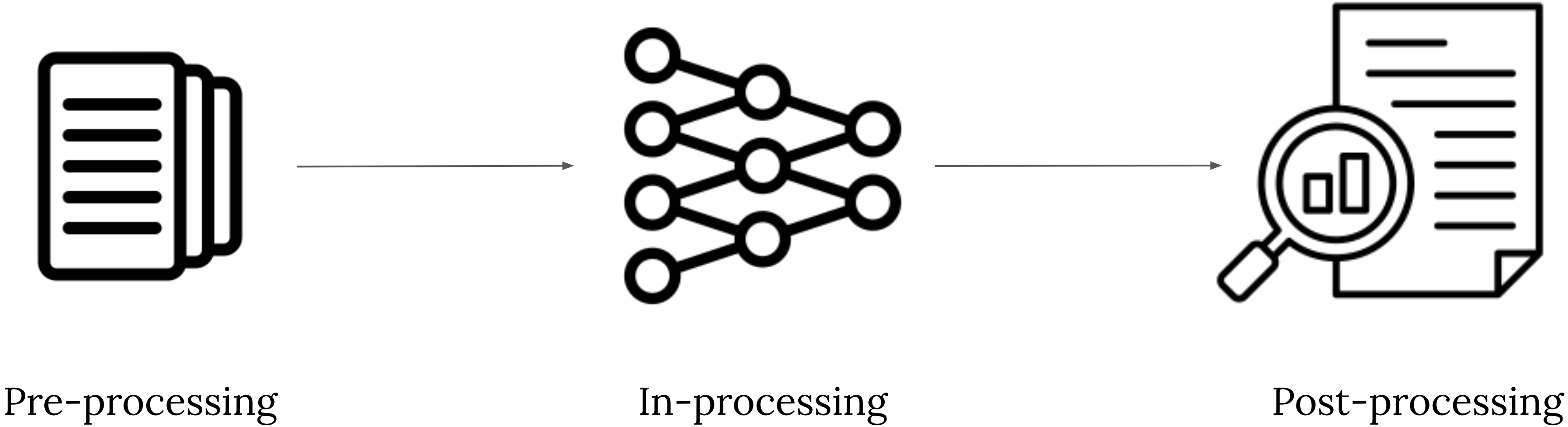
What is bias?

Abdel	Nora
Ph.D. from Mila 6 years of research experience	Ph.D. from Mila 6 years of research experience
Keep resume	Discard resume

How do we mitigate bias?

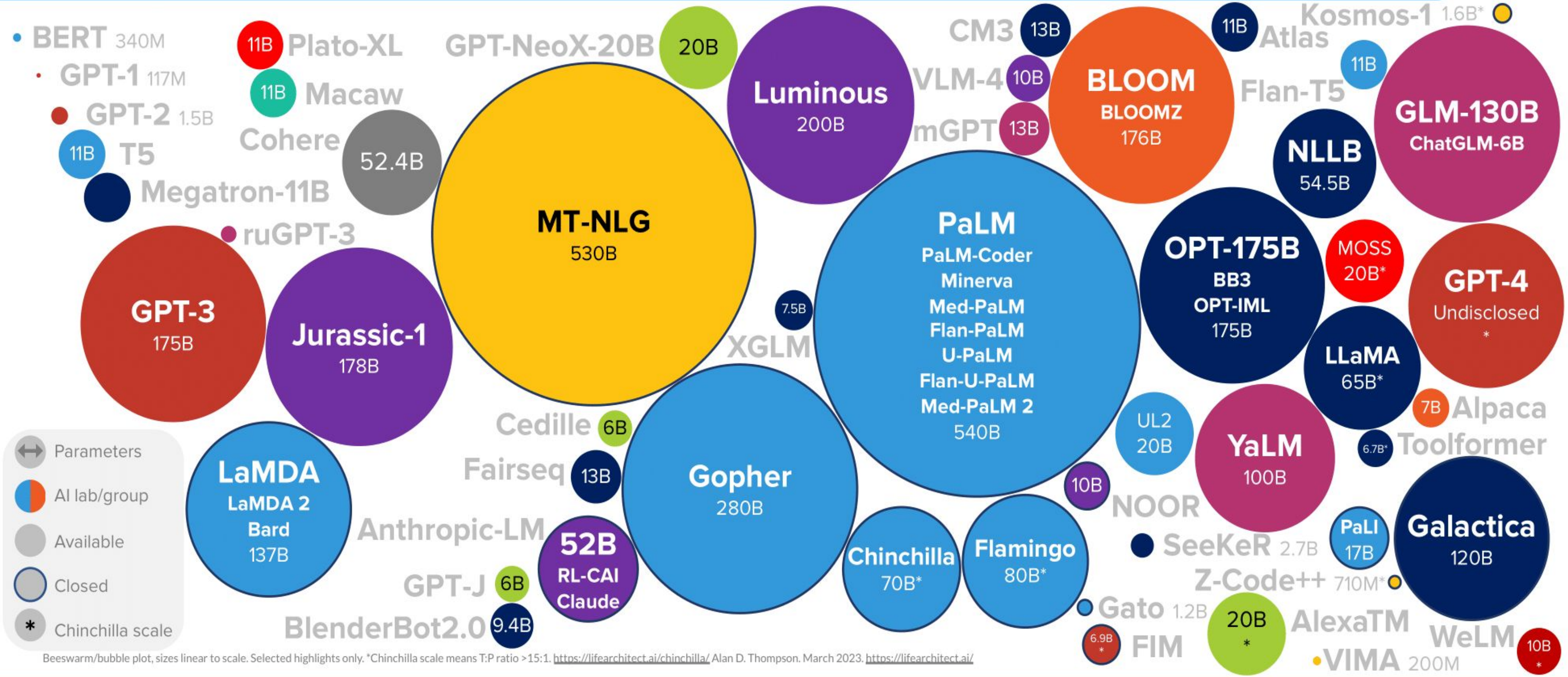


Pre-processing

In-processing

Post-processing

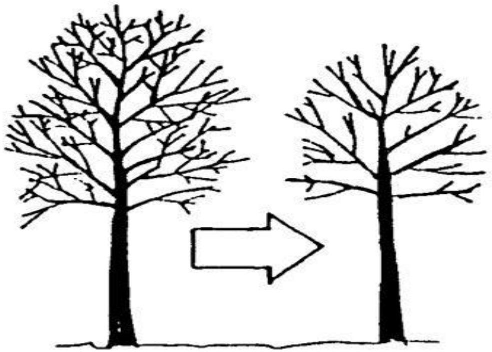
LANGUAGE MODEL SIZES TO MAR/2023



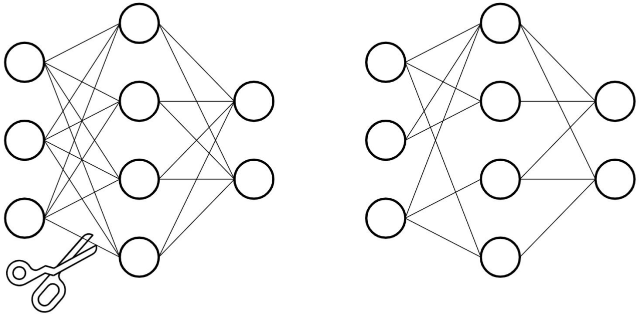
Beeswarm/bubble plot, sizes linear to scale. Selected highlights only. *Chinchilla scale means T:P ratio >15:1. https://lifearchitect.ai/chinchilla/ Alan D. Thompson. March 2023. https://lifearchitect.ai/

LifeArchitect.ai/models

Can pruning help?



Structured



Unstructured

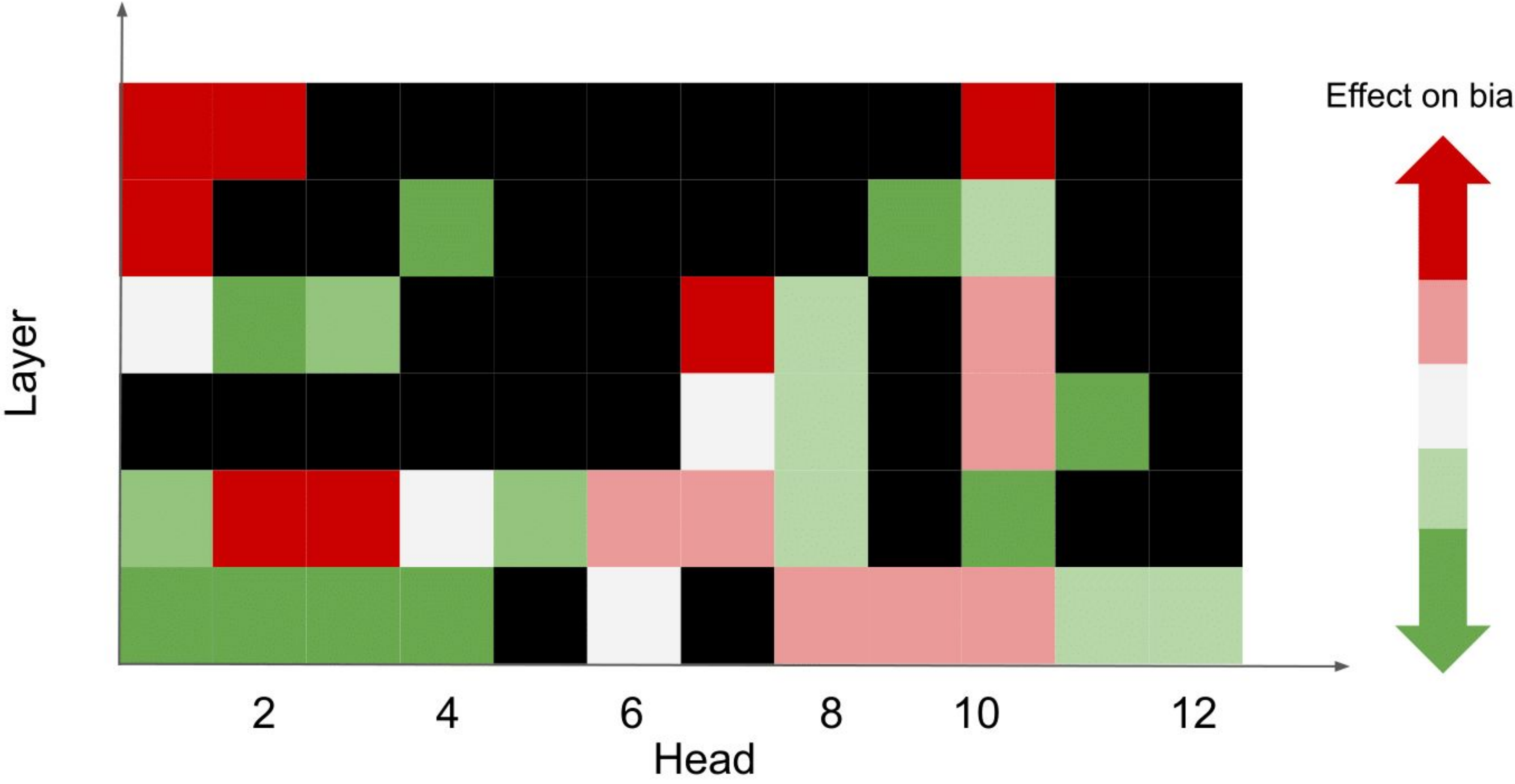
How does pruning affect fairness?

Let’s do a quick test!

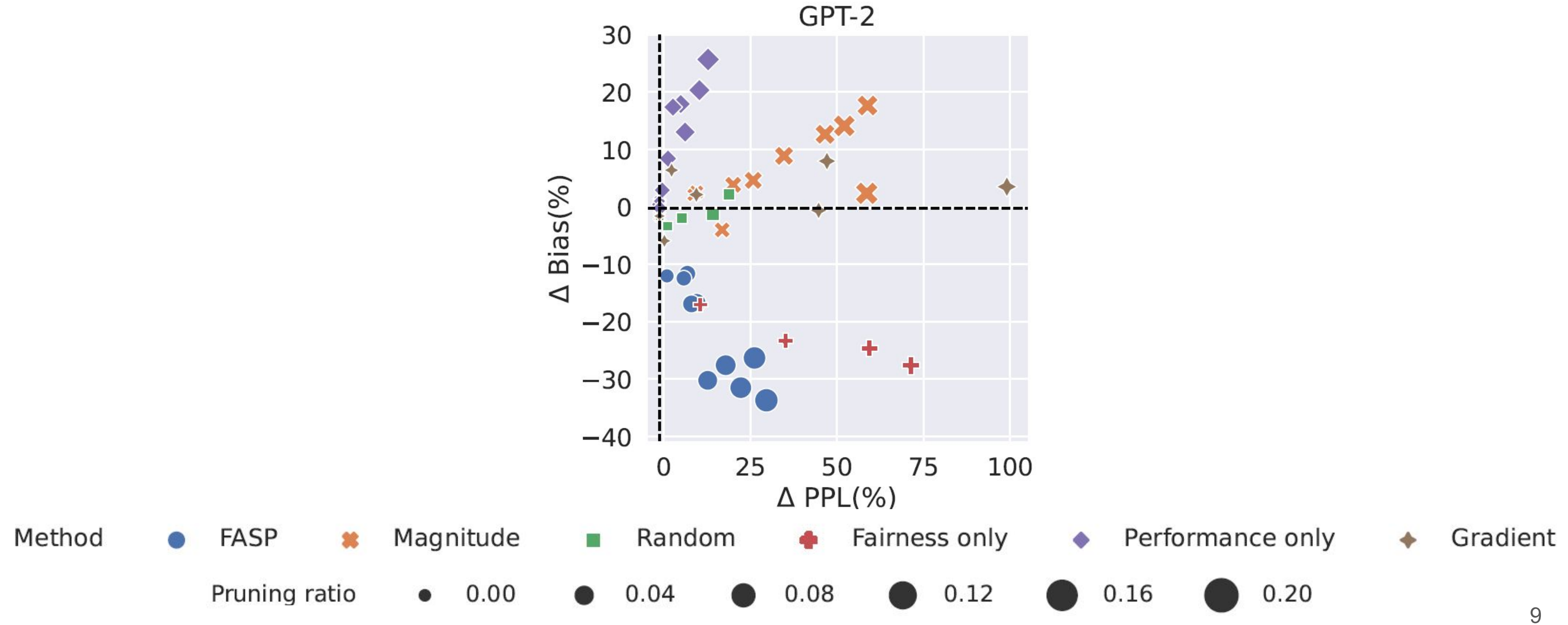
$$Effect\ of\ head\ h\ on\ bias = bias_{\text{with head } h} - bias_{\text{without head } h}$$

$$Effect\ of\ head\ h\ on\ ppl = ppl_{\text{with head } h} - ppl_{\text{without head } h}$$

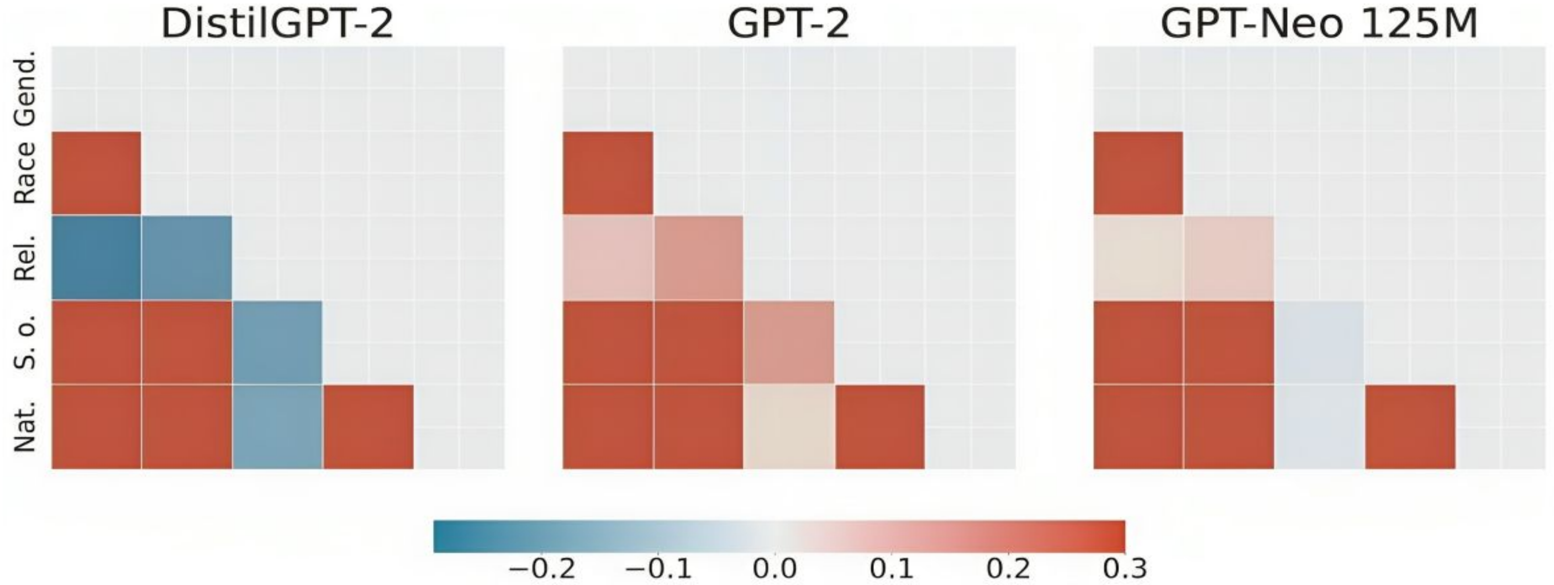
Fairness-Aware Structured Pruning (FASP)



How does FASP compare to other pruning metho



Does gender bias mitigation affect other biases?



To summarize

Some heads are responsible for ***bias*** and pruning them improves ***fairness***

Thanks for listening!