

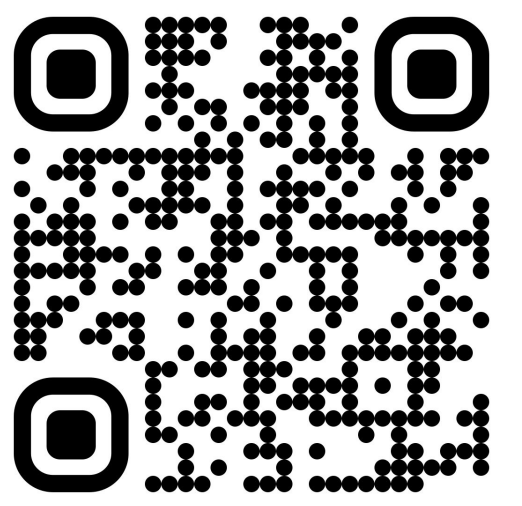
Algorithmic Phases of In-Context Learning: Understanding the transient nature of ICL

Core Francisco Park*, Ekdeep Singh Lubana*, Itamar Pres, Hidenori Tanaka+

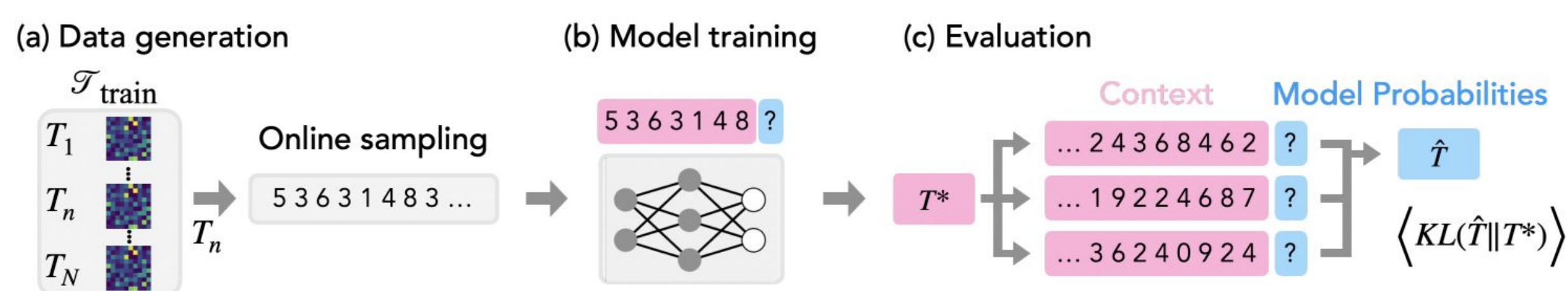
TL;DR:

1. Training Transformers on a mixture of Markov chains reproduce many in-context learning (ICL) phenomena.
2. The model can be decomposed into algorithms and the resulting phase diagram naturally explains the transient nature of ICL.

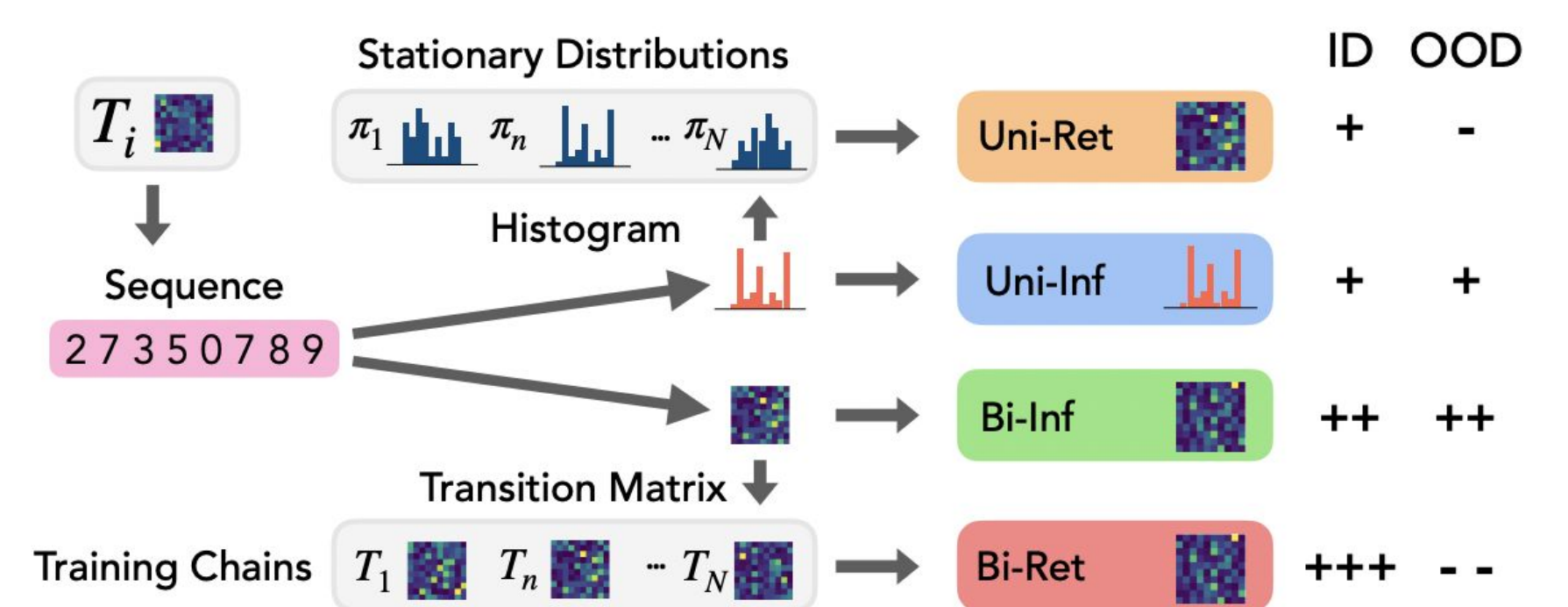
Paper



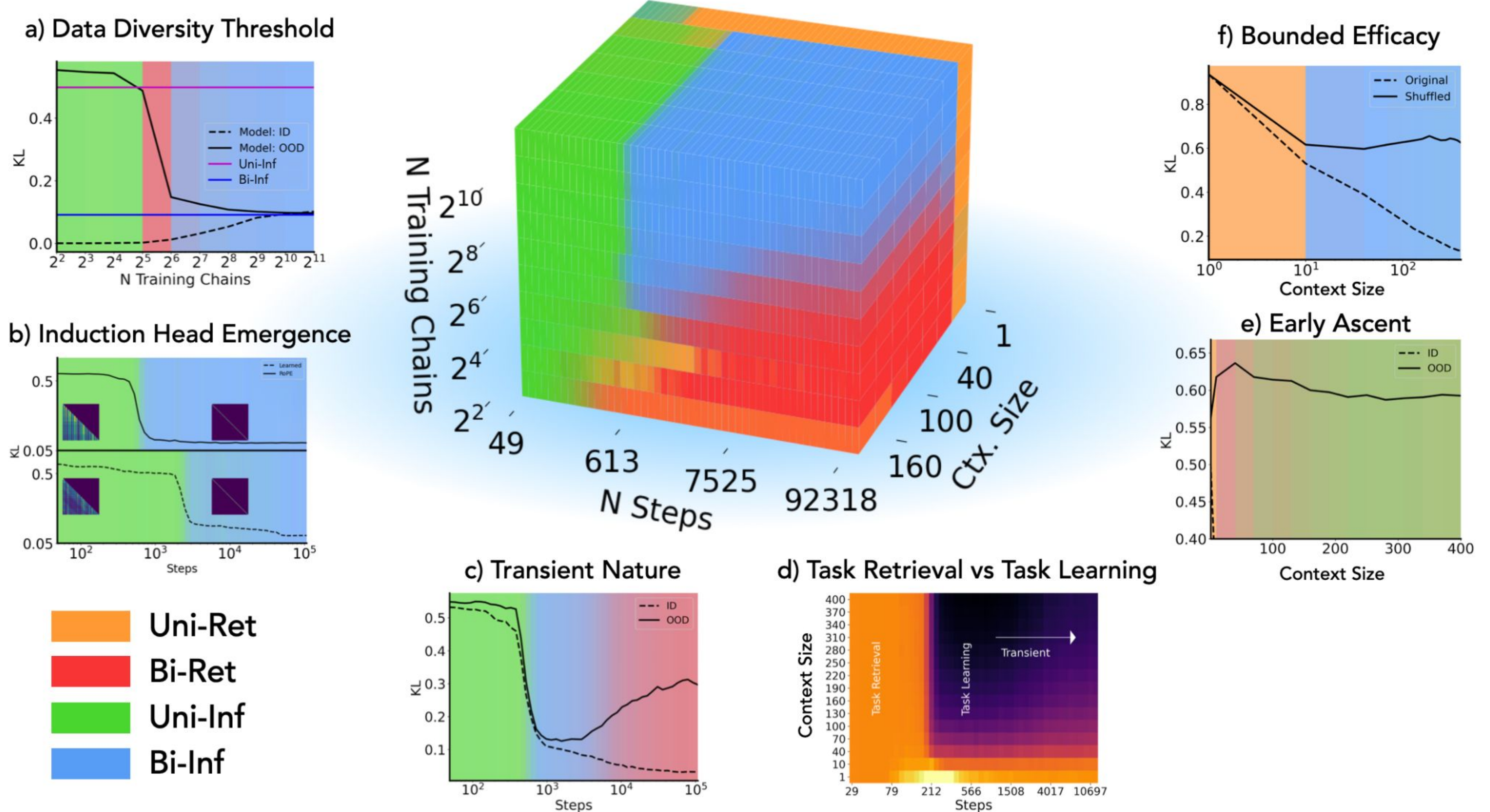
Setup



Solutions



Algorithmic phases of in-context learning



Why can ICL be transient?

ICL can be transient when there exists a more complex solution (**Bi-Ret**) better performing *in-distribution* which emerges later in training than the out-of-distribution generalizing solution (**Bi-Inf**).

