

Are Labels Necessary for Neural Architecture Search?

Chenxi Liu, Piotr Dollár, Kaiming He, Ross Girshick, Alan Yuille, Saining Xie

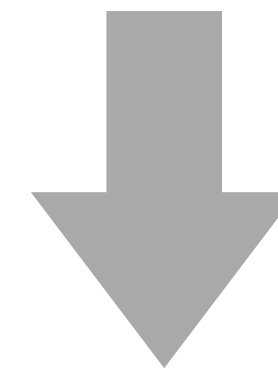
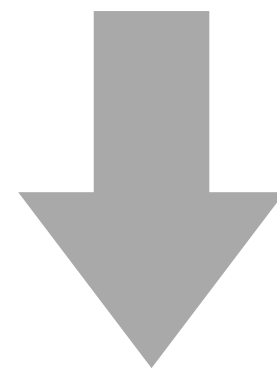
Spotlight @ECCV 2020

(Short Summary)

Designing neural architectures

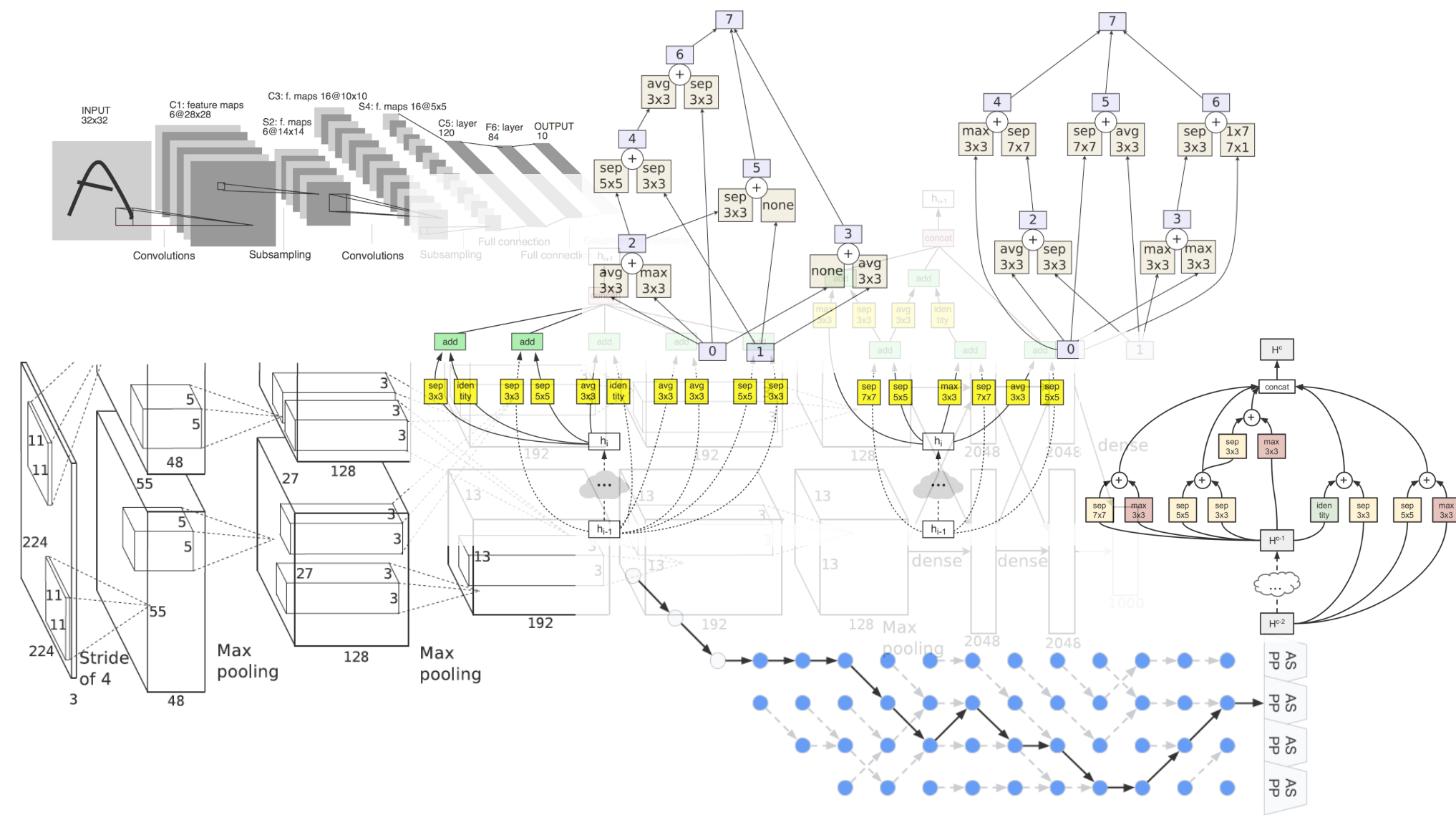
(, 6) (, ship) (, panda)

(, ~~6~~) (, ~~ship~~) (, ~~panda~~)



Current
Universe

PARALLEL
UNIVERSE

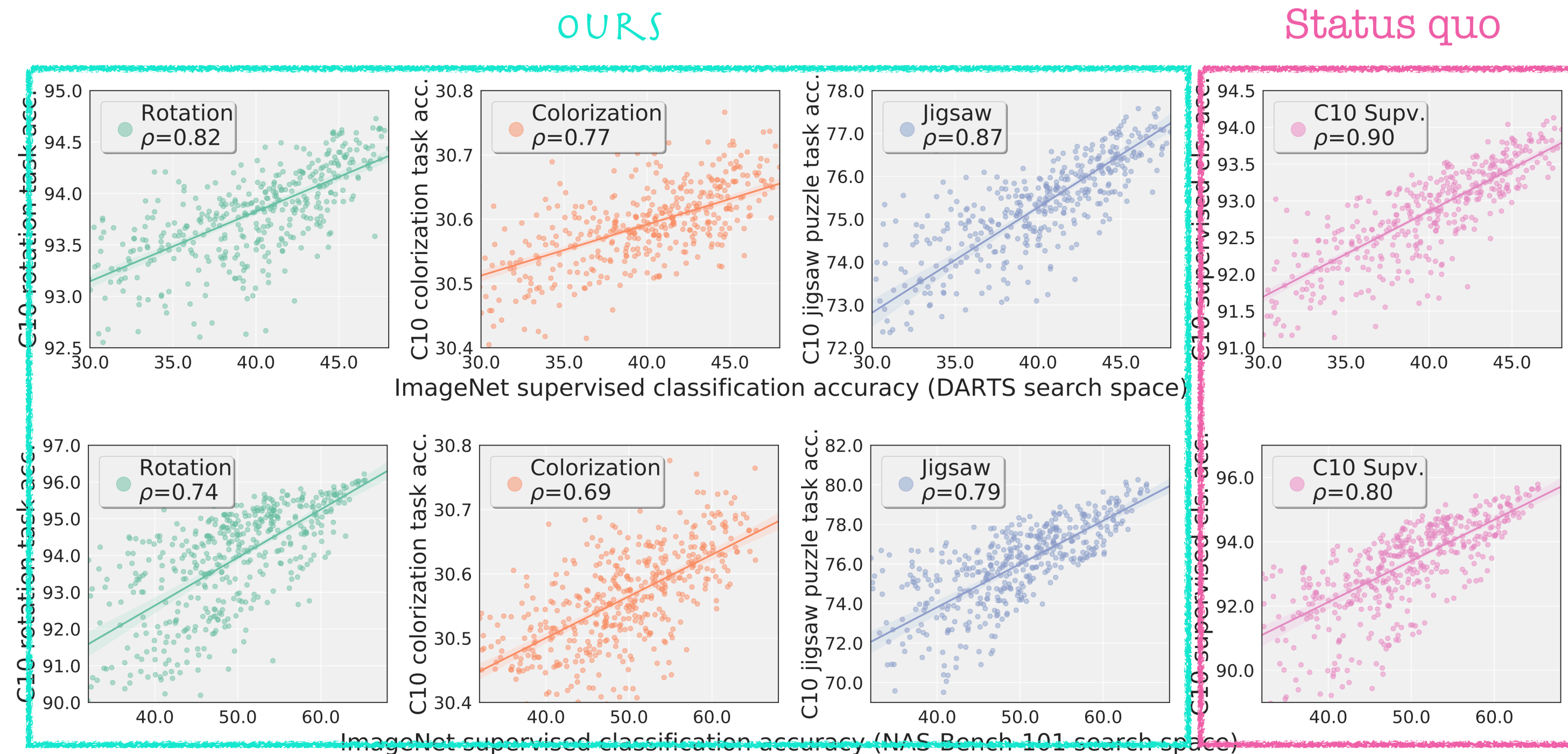


What neural architectures will we find?
Will they *look similar* to those on the left?
Will they *work as well* as those on the left?

Sample-based experiments

Architecture rankings produced with and without labels are **highly correlated**, across:

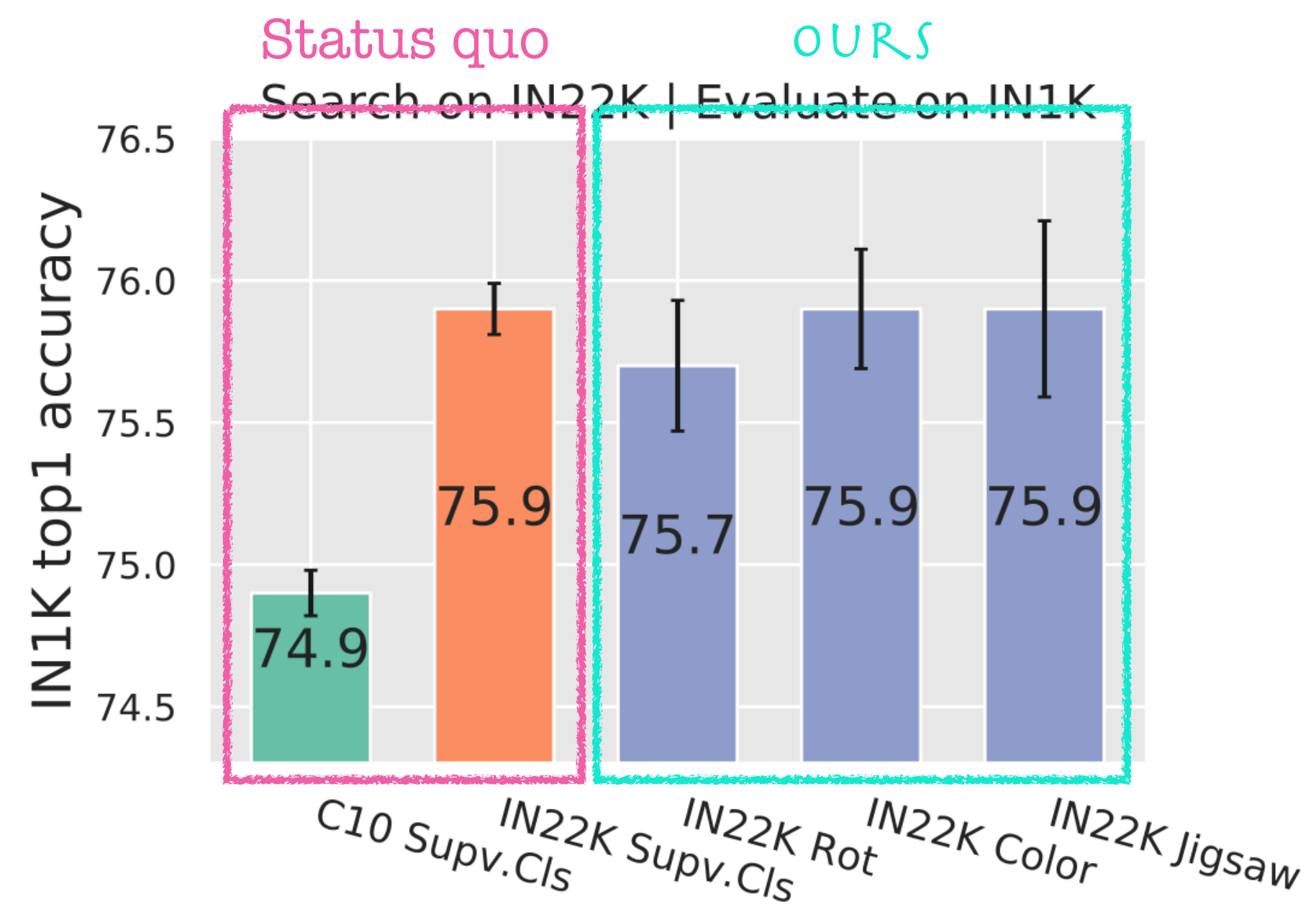
- 3 unsupervised tasks
- 2 datasets
- 2 search spaces



Search-based experiments

Architectures searched without labels are **highly competitive**, across:

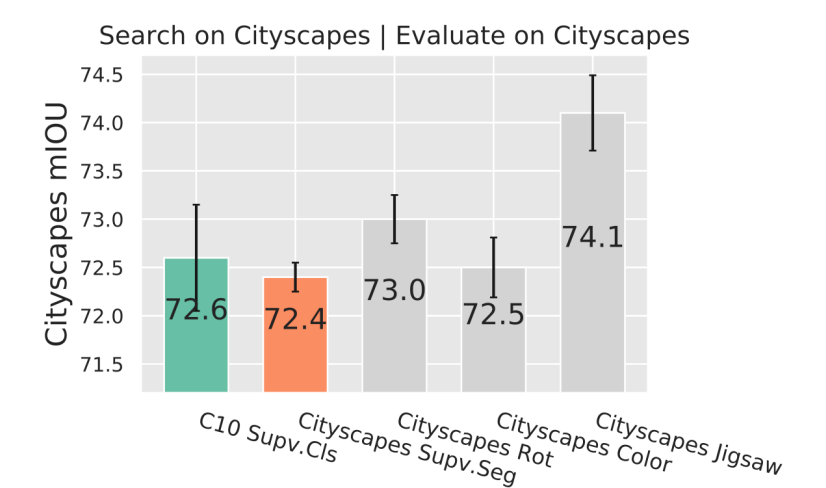
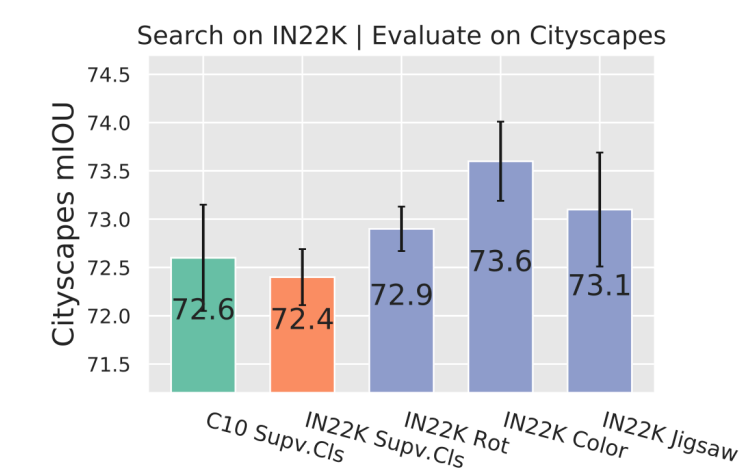
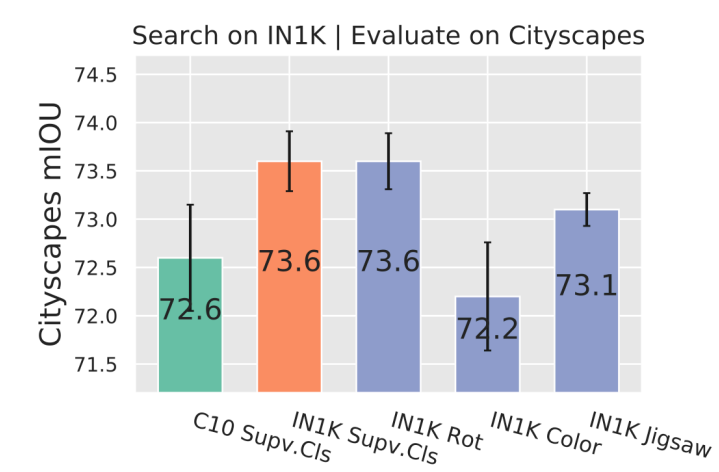
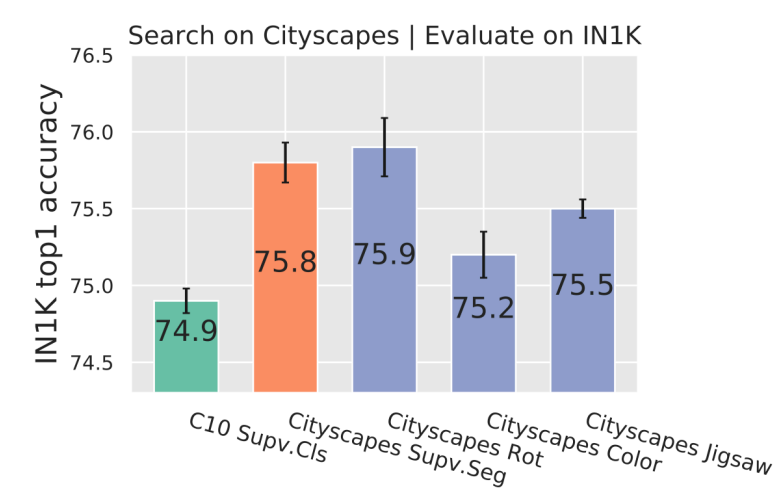
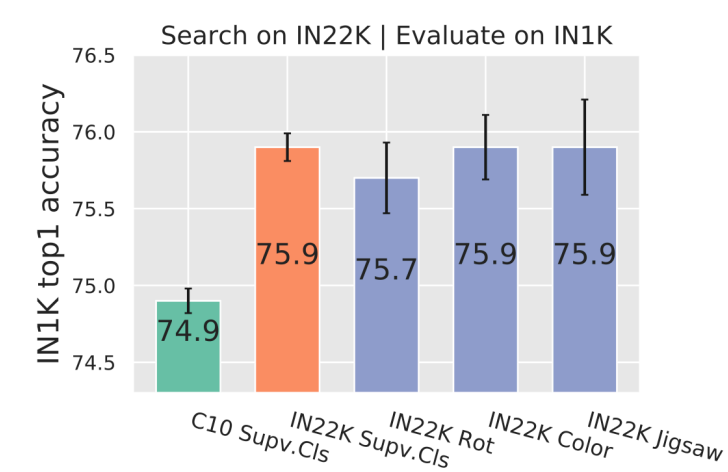
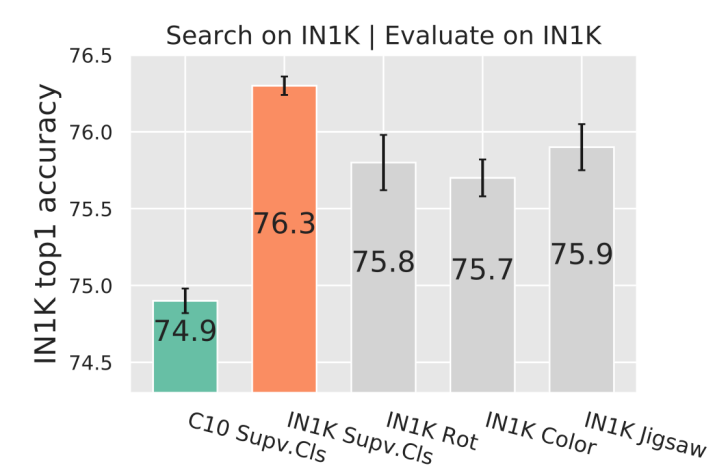
- 3 unsupervised search tasks
- 3 search datasets
- 2 supervised evaluation tasks
- 2 evaluation datasets



Search-based experiments

Architectures searched without labels are **highly competitive**, across:

- 3 unsupervised search tasks
- 3 search datasets
- 2 supervised evaluation tasks
- 2 evaluation datasets



To perform NAS *successfully*,
labels are *not necessary*

Thank you!