

## Supplementary Materials

### **BARN: Behavior-Aware Relation Network for multi-label behavior detection in socially housed macaques**

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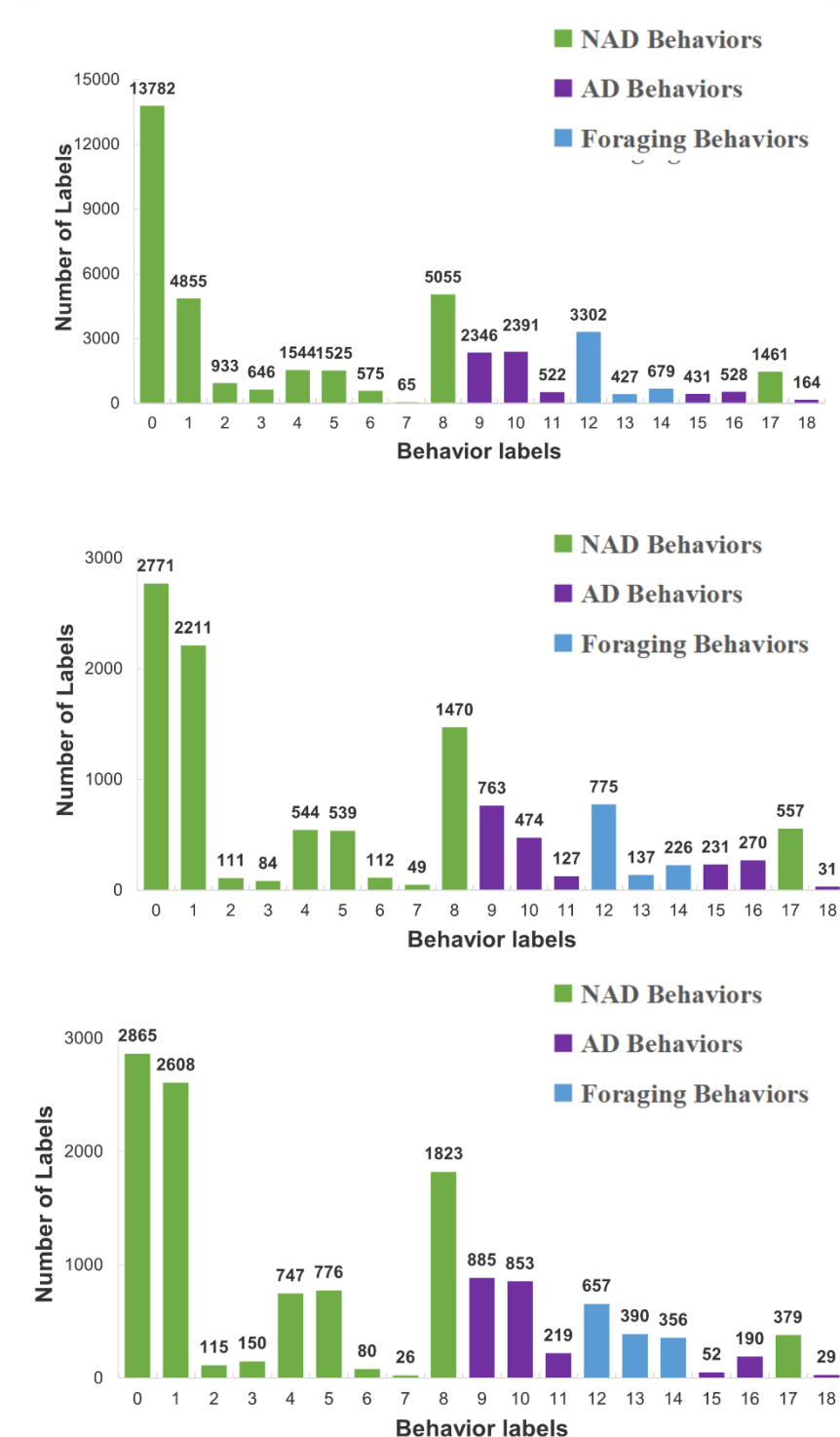
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## Supplementary Materials and Methods

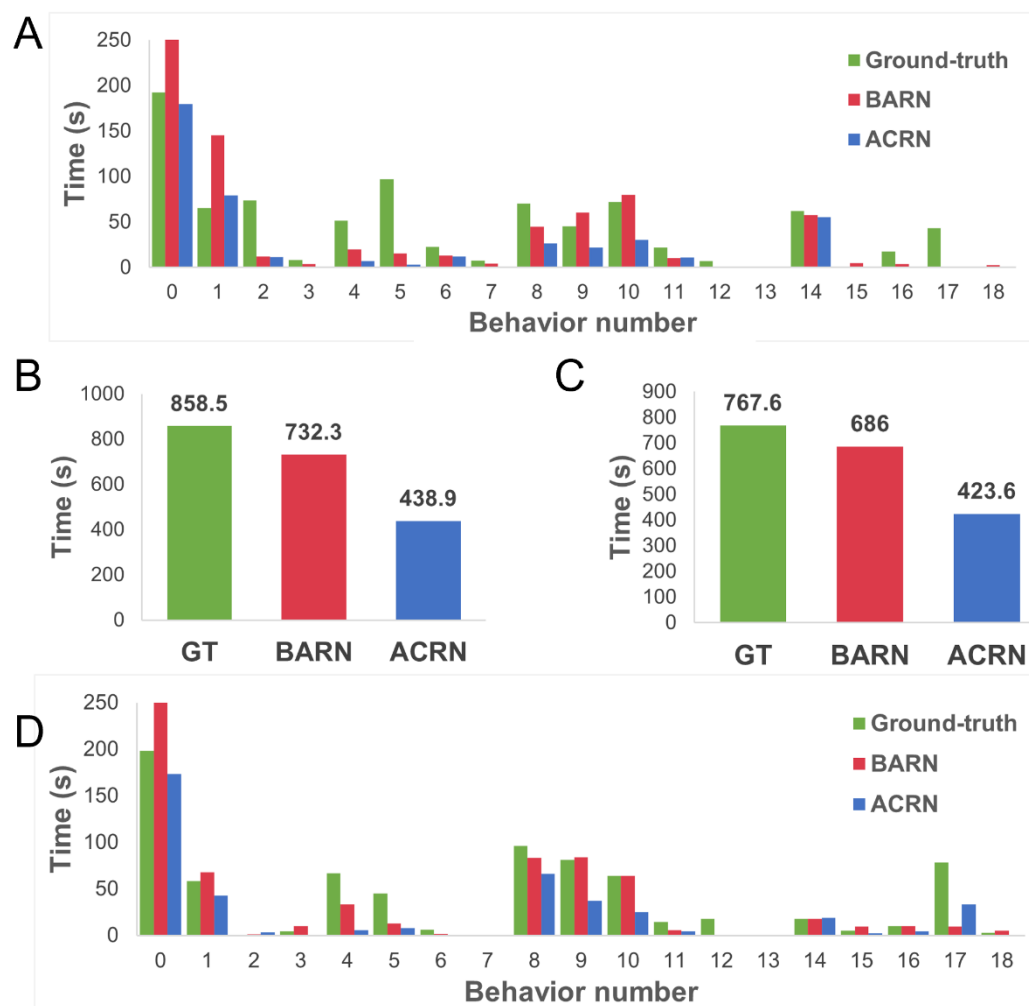
The numbers of labels in the train, val, and test sets are shown in Supplementary Figure S1. The durations of behaviors of the green and red macaques on the test set of the identity dataset are shown in Supplementary Figure S2, while those of the black and white macaques are shown in Supplementary Figure S3.



**Supplementary Figure S1 Number of labels in train, val, and test sets**

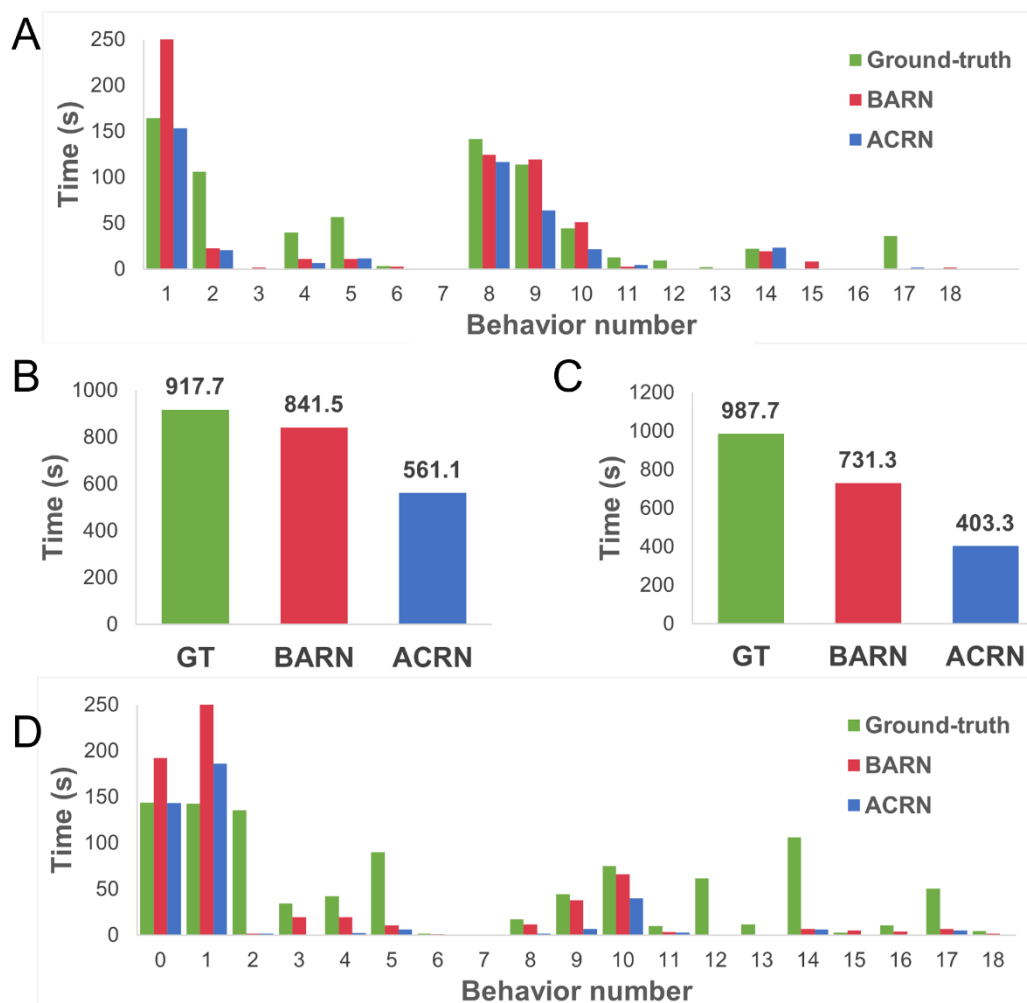
Abcissa is behavior labels; ordinate is label number. NAD, behaviors without

apparent displacement. AD, behaviors with apparent displacement.



**Supplementary Figure S2 Duration of behaviors generated by ground-truth, BARN (ours), and ACRN (Sun et al., 2018) on test set of proposed macaque behavior dataset**

A: Duration of each behavior for green macaques. B: Total duration of all behaviors for green macaques. C: Total duration of all behaviors for red macaques. D: Duration of each behavior for red macaques.



**Supplementary Figure S3 Duration of behaviors generated by ground-truth, BARN (ours), and ACRN (Sun et al., 2018) on test set of proposed macaque behavior dataset**

A: Duration of each behavior for black macaques. B: Total duration of all behaviors for black macaques. C: Total duration of all behaviors for white macaques. D: Duration of each behavior for white macaques.