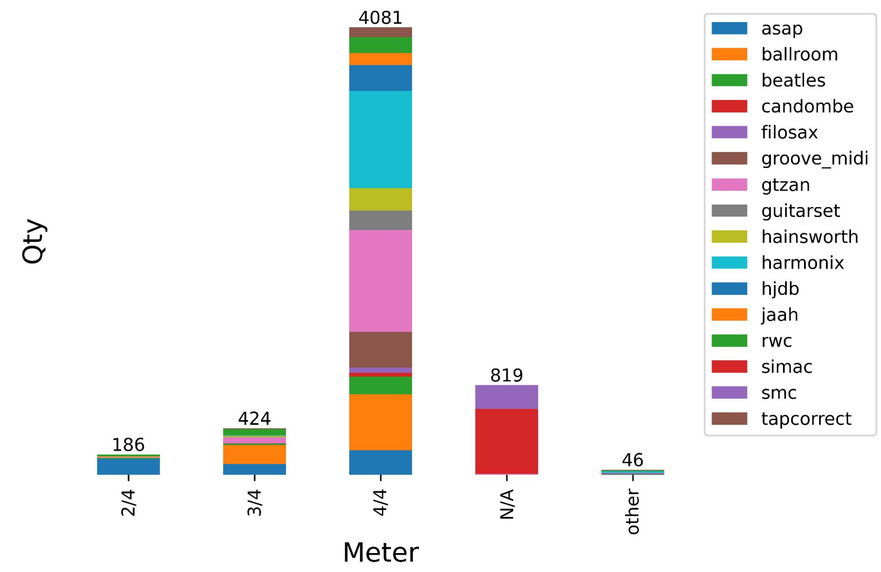
We propose an **augmentation procedure** to increase tracks in underrepresented meters, namely 2/4 and 3/4, for beat and downbeat tracking datasets

Skip That Beat: Augmenting Meter Tracking Models for Underrepresented Time Signatures

Background: Beat and downbeat tracking models are predominantly developed using datasets with music in 4/4 meter, which decreases their generalization to repertories in other time signatures. We propose a simple augmentation technique to increase the representation of time signatures beyond 4/4. We test the effectiveness by training two models (BayesBeat and TCN) and evaluating their results in seen and unseen datasets.



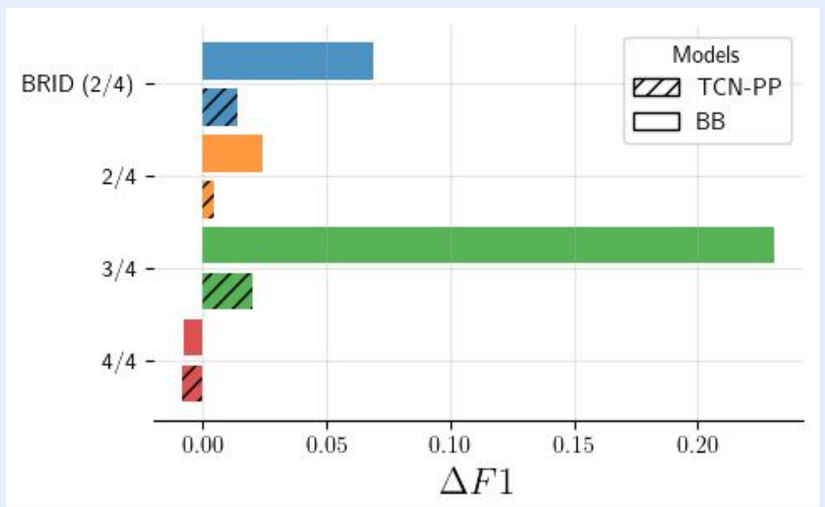
Result 1:

		Beat					Downbeat				
		F1	CMLt	CMLc	AMLt	AMLc	F1	CMLt	CMLc	AMLt	AMLc
BB	B	0.70	0.53	0.46	0.76	0.61	0.41	0.31	0.29	0.49	0.45
	AugF	0.71	0.54	0.47	0.78	0.63	0.49	0.38	0.35	0.60	0.54
TCN-PP	B	0.72	0.42	0.27	0.63	0.36	0.36	0.00	0.00	0.29	0.11
	AugF	0.74	0.47	0.33	0.64	0.39	0.36	0.01	0.00	0.23	0.11

Table 1. Average results for the models across all time signatures.

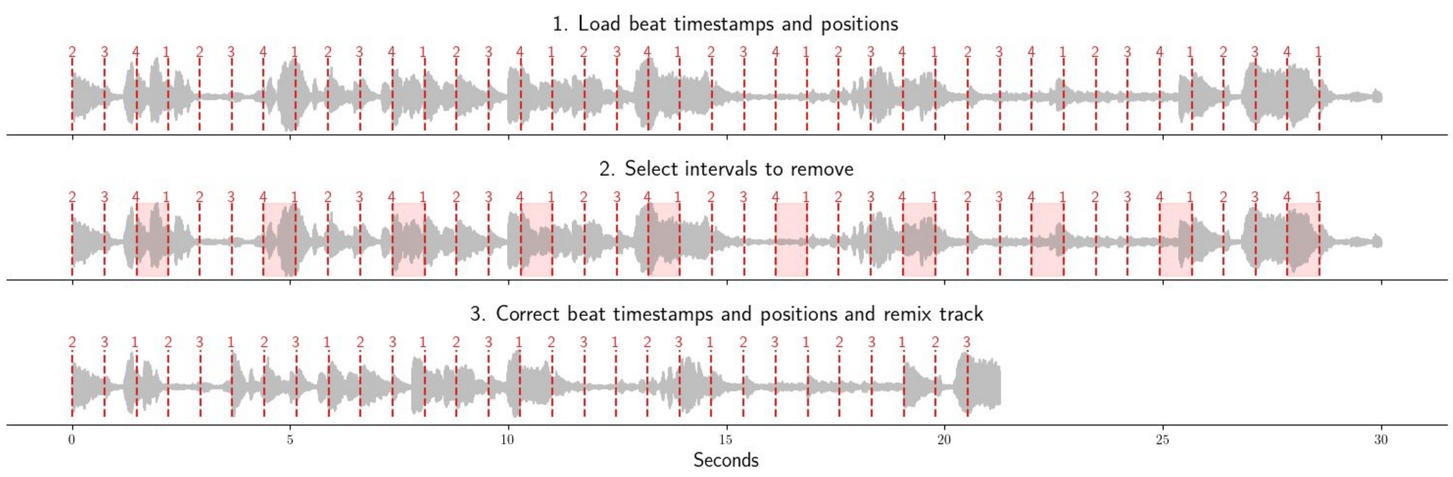
Beat tracking results remained stable while downbeat tracking results showed improvements in F-measure and continuity metrics

Result 2:



AugF metrics compared with the baseline. The biggest improvement was seen in 3/4.

Augmentation Procedure



Train and Test Data

Limitations: *The current augmentation method makes sense from a counting perspective, but does not address correctly different rhythmic patterns and accentuations. Future work should focus on creating more sophisticated augmentations, including, for example, internal meter changes and accents on offbeats.*

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