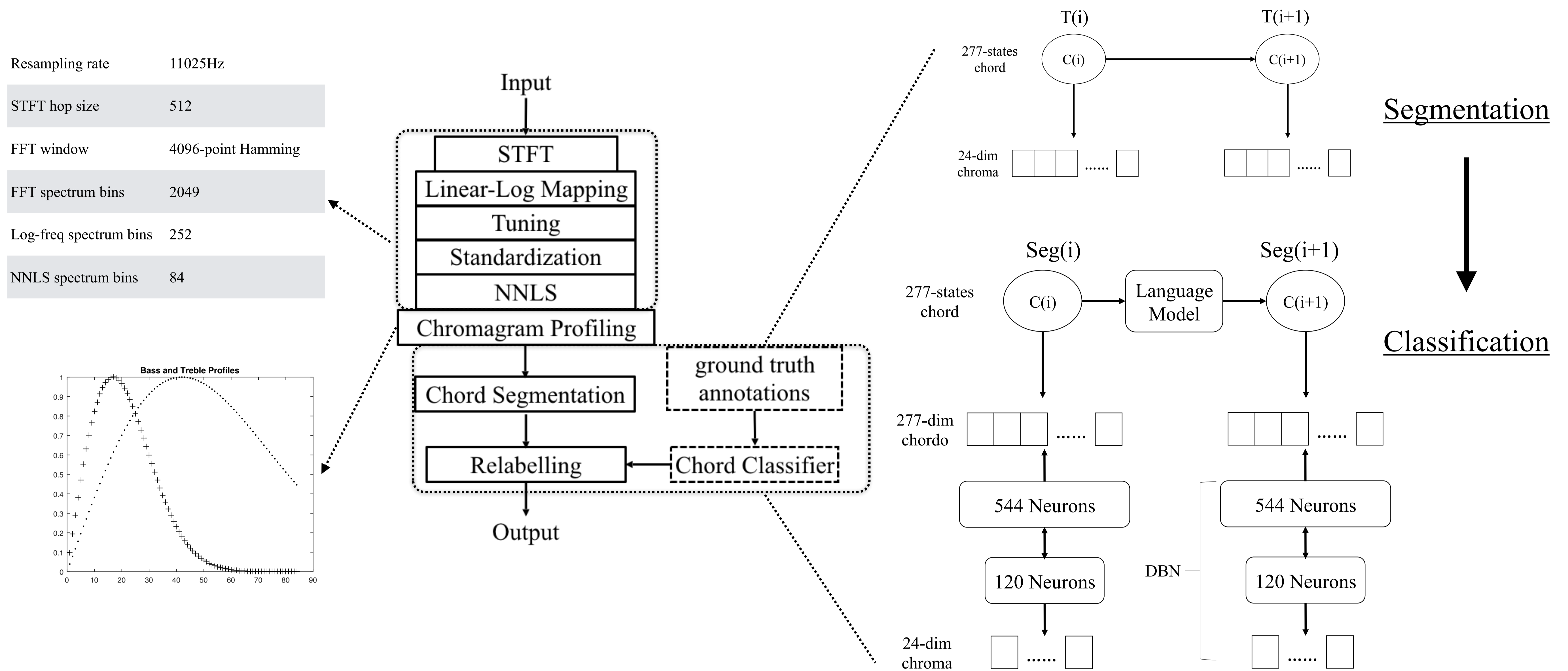


# Automatic Chord Estimation on SeventhsBass Chord Vocabulary Using Deep Neural Network

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The same system frontend (chordino-like) is used to pre-process and segment the training data:

- CH: chordino
- DK6 (HM): baseline system without the chord relabelling. (similar to CH)
- DK5 (DN): feedforward neural network; trained on JayChou29 dataset only.
- DK9: deep belief network; both pre-trained and fine-tuned using JayChou29 dataset and 1/3 of TheBeatles180 dataset.
- DK9' (DB): similar to DK9 but trained only on JayChou29 dataset
- NIV (NI): baseline system that only supports maj and min chords

	M/5	M/3	M	M7/5	M7/3	M7/7	M7	7/5	7/3	7/b7	7	m/5	m/b3	m	m7/5	m7/b3	m7/b7	m7
CH	19.9	17.1	54.4	0	0	0	55.6	0	0	5.7	41.0	0	0	54.3	0	0	0	51.0
H	37.1	17.2	67.3	0	0	13.6	22.1	0	0	8.8	3.6	23.1	15.3	56.8	0	0	0.8	10.7
D	24	25.1	67.9	0	0	0	39.4	0	10.1	13.2	4.1	4.4	9.8	58.9	0	0	0.7	36.2
DB	23.1	26	66.7	0	0	0	36.6	0	1.9	18.5	4.5	4.4	11.4	58.6	0	0	0.5	32.5
NI	0	0	79.3	0	0	0	15.4	0	0	0	2.6	0	0	73.9	0	0	0	10.2

TheBeatles180 test SeventhsBass details (This paper)

	Mm	MmB	S	SB	Seg	Inv?	#Types
CM3	72.22	70.21	55.35	<b>53.39</b>	83.63	<b>Yes</b>	<b>10</b>
KO1	75.58	73.51	57.68	<b>55.82</b>	84.16	<b>No</b>	<b>7</b>
JR2	60.37	48.72	45.74	36.56	75.14	No	17
CB3	77	75	65	<b>63</b>	86	<b>No</b>	<b>13</b>
NMS	76	74	65	<b>63</b>	84	<b>No</b>	<b>10</b>
PP3	73	70	53	51	84	No	2
NG1	71	69	52	50	84	No	2
DK5	69.98	66.51	55.43	52.48	82.97	<b>Yes</b>	<b>19</b>
DK6	71.37	61.45	56.36	48.67	83.38	<b>Yes</b>	<b>19</b>
DK9	73.03	71.64	55.78	<b>54.58</b>	83.10	<b>Yes</b>	<b>19</b>

Billboard 2012 test (since MIREX ACE 2013)

	Mm	MmB	S	SB	Sum
CH	74.3	71.4	53.0	50.6	301.2
HM	74.2	62.6	66.0	55.5	278.7
DN	71.4	66.5	62.0	57.8	297.1
DB	70.5	65.6	61.3	57.0	288.4
NI	74.3	72.3	66.2	64.4	183.7

TheBeatles180 test (This paper)

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[3] Mauch, Matthias. 2010. "Automatic Chord Transcription from Audio Using Computational Models of Musical Context."

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