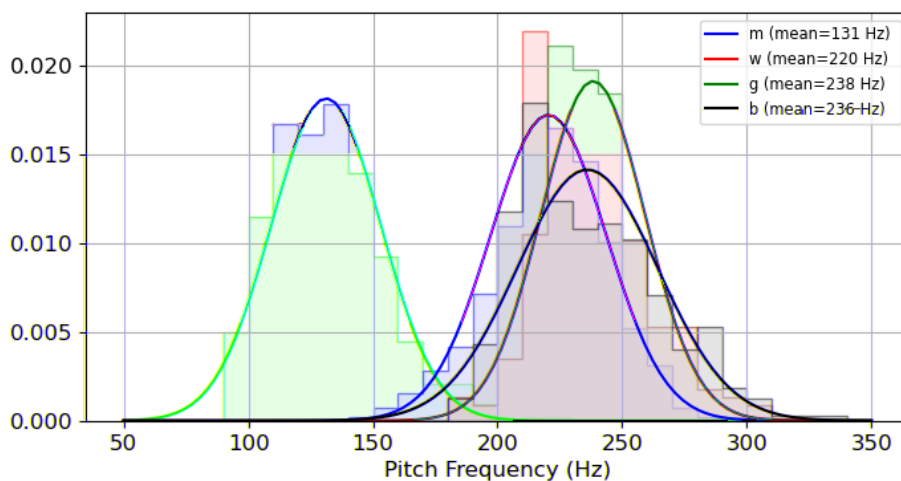


MATH Tables (log, log10 and exp)

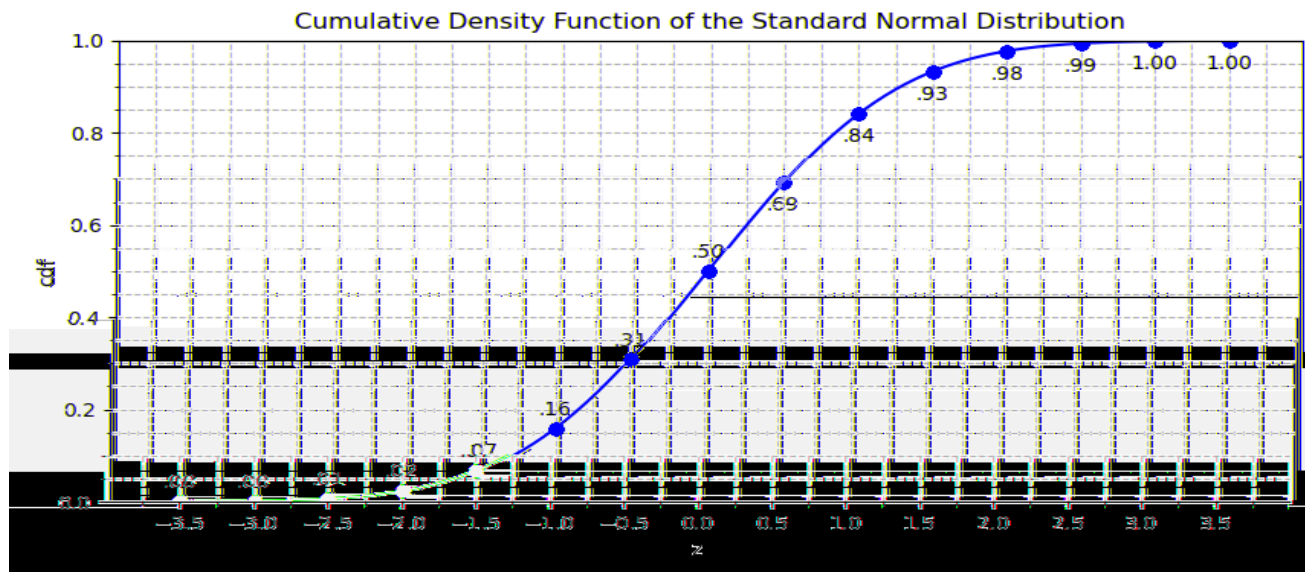
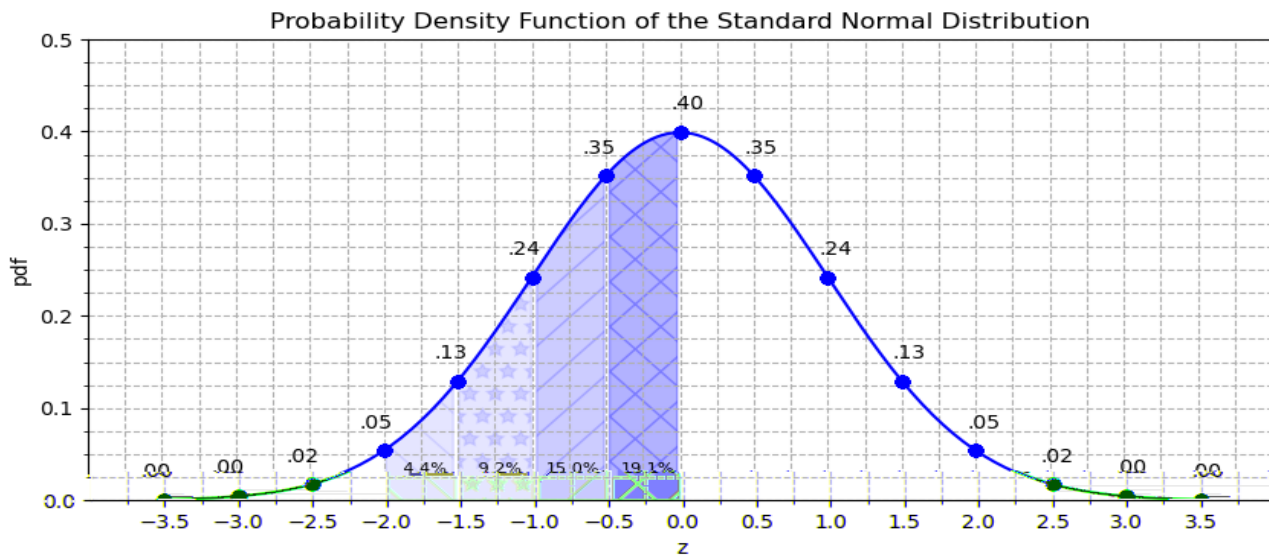
x	log10(x)	log(x)	exp(-x)
0,10	-1,000	-2,303	0,905
0,20	-0,699	-1,609	0,819
0,30	-0,523	-1,204	0,741
0,40	-0,398	-0,916	0,670
0,50	-0,301	-0,693	0,607
0,70	-0,155	-0,357	0,497
0,90	-0,046	-0,105	0,407
1,00	0,000	0,000	0,368
1,50	0,176	0,405	0,223
2,00	0,301	0,693	0,135
2,50	0,398	0,916	0,082

Distributions of PITCH with respect to age and gender

These are average pitch values measured in neutrally pronounced single syllable words



Standard Normal Distribution



z	$\text{pdf}(z)$	$\text{cdf}(z)$
-3.5	0.0009	0.0002
-3.0	0.0044	0.0013
-2.5	0.0175	0.0062
-2.0	0.0540	0.0228
-1.5	0.1295	0.0668
-1.0	0.2420	0.1587
-0.5	0.3521	0.3085
0.0	0.3989	0.5000

$z(\pm\sigma\text{'s})$	prob(%)
0.0	0.00
0.5	38.29
1.0	68.27
1.5	86.64
2.0	95.45
2.5	98.76
3.0	99.73
3.5	99.95

English Phone Set, Phone Classes, Examples

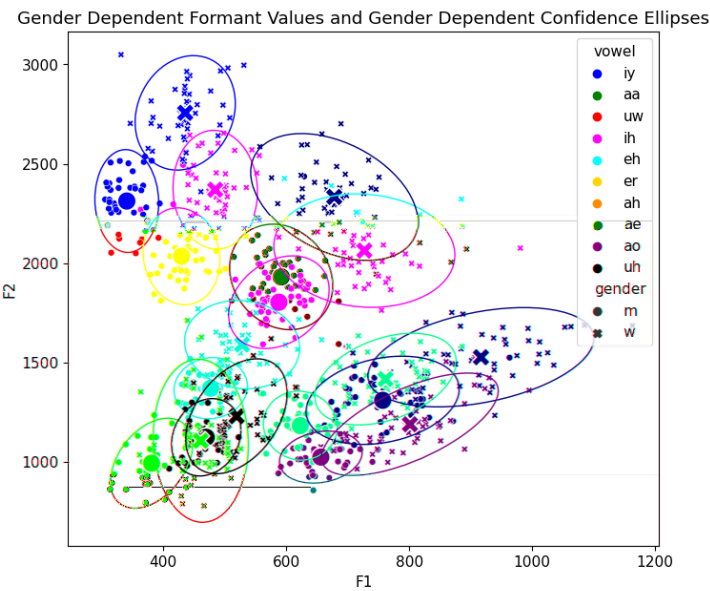
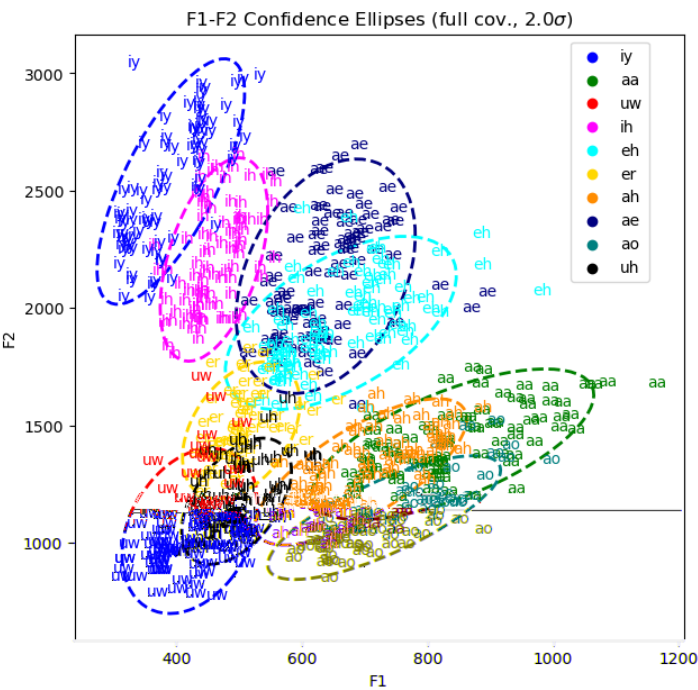
	example	transcript	phone class		example	transcript	phone class
AA	balm	B AA L M	vowel	B	buy	B AY	plosive
AE	bat	B AE T	vowel	CH	church	CH ER CH	affricate
AH	butt	B AH T	vowel	D	die	D AY	plosive
AO	bought	B AO T	vowel	DH	thy	DH AY	fricative
AW	bout	B AW T	vowel	F	fight	F AY T	fricative
AY	bite	B AY T	vowel	G	guy	G AY	plosive
EH	bet	B EH T	vowel	HH	high	HH AY	aspirate
ER	bird	B ER T	vowel	JH	jive	JH AY V	affricate
EY	bait	B EY T	vowel	K	kite	K AY T	plosive
IH	bit	B IH T	vowel	L	lie	L AY	liquid
IY	beat	B IY T	vowel	M	my	M AY	nasal
OW	boat	B OW T	vowel	N	nigh	N AY	nasal
OY	boy	B OY	vowel	NG	sing	S IH NG	nasal
UH	book	B UH K	vowel	P	pie	P AY	plosive
UW	boot	B UW T	vowel	R	rye	R AY	liquid
				S	sigh	S AY	fricative
				SH	shy	SH AY	fricative
				T	tie	T AY	plosive
				TH	thigh	TH AY	fricative
				V	vie	V AY	fricative
				W	wise	W AY Z	semivowel
				Y	yacht	Y AH T	semivowel
				Z	zoo	Z UH	fricative
				ZH	pleasure	P L EH ZH	fricative

Typical FORMANT values for American English Vowels

Mean F1-F2-F3 Formant values (in HZ) measured on the Hillenbrand Database

	vowel	iy	ih	eh	ae	aa	ao	uh	uw	ah	er
F1	m	340	429	588	591	756	656	469	380	621	476
	w	435	484	727	678	916	801	519	460	760	527
F2	m	2312	2034	1803	1930	1309	1023	1123	992	1181	1370
	w	2756	2369	2063	2332	1526	1188	1229	1106	1416	1589
F3	m	3001	2687	2604	2595	2535	2521	2435	2355	2548	1711
	w	3373	3057	2953	2973	2823	2819	2829	2735	2901	1930

F1-F2 Distributions (confidence ellipses are shown at 2 times sigma)



Grid Plot of pitch and formants combined

The plots are based on adult data in the Hillenbrand database.

Only 6 vowels spread over the vowel triangle are shown in order not to overload the picture

