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Composing modification of the Uzbek Phonetic Alphabet based on International Phonetic Alphabet

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ABSTRACT: The article deals with creating a new phonetic alphabet for the formal grammar of the Uzbek language, using the current phonetic alphabet of the Uzbek language and the International Phonetic Alphabet.

KEY WORDS: International Phonetic Alphabet; formal grammar of the Uzbek language; Uzbek phonetic alphabet; phonetic and phonemic transcription; interactive software.

I. INTRODUCTION

In the recent years, the term "computer modeling" has been equally used parallel to the term "mathematical modeling". The reason for this is that, the subject "Theory of Algorithms" came to the world science with its fundamental laws. The rules of the mathematical linguistics and the theory of algorithms are equally used for the computer modeling of linguistic phenomena in the same way.

In order to create the linguistic supply of automated systems for a particular natural language, firstly, it is necessary to learn the grammar, lexicon and phonetics of the language in terms of mathematical linguistics. Because, on the basis of that necessity, there is a point of developing formal aspects of the natural language with combined fundamental laws of the practical linguistics, informatics, mathematical sciences and theory of algorithms. When teaching any natural language, its alphabet is certainly addressed. In the meantime of learning the alphabet, learners face to the matters of orthography, orthoepy, and phonetics of that language.

It is important to note that, although phonetics is one of the first steps in learning the language, it is difficult to investigate and conclude with certain limitation on it. Phonetics or phonetic phenomena are always the most important and vital matters of linguistics.

At present, the problem of computer modeling of the phonological system of the Uzbek language and its various elements, in particular, the transcription of the language is one of the most important tasks in the field of the Uzbek computer linguistics.

Moreover, "researches in the world computer linguistics, such as a text editor, a speech synthesizer, a text corpus, a linguistic analysis software, and textual referral played important role in creating large linguistic bases in linguistics. In this regard, the role of social networks, scientific and technical texts on the internet, and written, oral translator programs in various conferences are also essential. … However, since there aren't enough researches on machine translation in the Uzbek computer linguistics, it is necessary to create a linguistic database of the Uzbek language for the Uzbek- other and vice versa translator programs. ... It is important to study the machine translation, to provide linguistic supply, the algorithm of translation and mathematical models of speech structures for translator programs, which are on the basis of formal grammar of the Uzbek and English languages"[1].

Computer linguistics sources emphasize that, its implementation areas are expanding, and adaptation of natural language to computer is one of its practical challenges [2].

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II. EXPERIMENTAL PART

It is known that in the Uzbek linguistics and in the Uzbek dialectology, transcription typically based on Russian and Latin is applied parallel. There is a transcription that is based on Latin alphabet and is widely used worldwide in linguistics, and it refers to the International Phonetic Alphabet (IPA). This International Phonetic Alphabet, founded in 1888 by the International Phonetic Association, consists of more than 150 diacritic characters (vowels- 28, pulmonary consonants - 59, non-pulmonary consonants - 15, affricates - 8, etc.) [6].

It should be noted that, at the time of rapid expansion of technical development, scientific reflection should not be restricted on phonogram based on national alphabet only. Because, accessing to an international scientific community, having an intellectual activity specific to the information society by this way are difficult matters.

It is necessary to further expand the research sphere of the Uzbek language in order to carry it to the automated information system, which is the central part of today's modernization. There are many ways to solve this problem, one of which is to re-establish **the Uzbek phonetic alphabet** on the basis of International Phonetic Alphabet.

Of course, none of the phonetic or phonemic transcriptional characters in the phonetic alphabet can accurately describe the phonetics of a given language, this is certainly relative. Nevertheless, writing some of the internationally recognized concepts and terms in this alphabet has positive significance in their phonetic closeness and pronunciation accuracy.

For instance, on following webpage **http://www.ipachart.com**[5] there is given fragment from interactive software related to vowel classification which is based on International Phonetic Alphabet characters. (Figure 1):

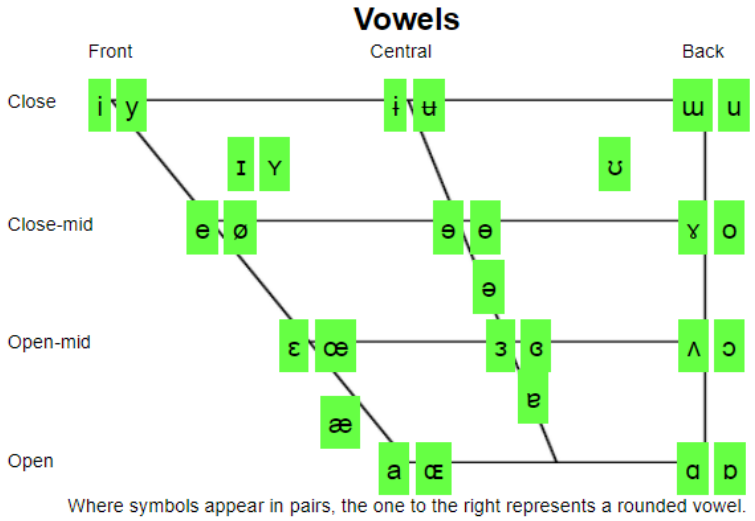

Fig1: Online interactive software for classifying vowels based on sound effects on the webpagehttp://www.ipachart.com

If we represent the sounds in the Uzbek language with the same interactive software as the above, then we have to computerize 14 sounds for the vowels, 34 for the consonants, and 48 sounds total. [3]. But there is no need for all the sounds of this speech and the phoneme to create the formal alphabet which we refer to. Because the phonetic layer of this word does not seem to be changed strongly, even if it is used the allophones of any word in the own lexicon of the Uzbek language or the lexicon acquired from eastern language.

Therefore, for creating the modified phonetic alphabet of the Uzbek language, we have based on strong phonemes of the International Phonetic Alphabet, using the same principles as phonetic and phonemic transcription (Table 1):

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Table 1: Uzbek Phonetic Alphabet and IPA

Uzbek Alphabet	Uzbek Phonetic Alphabet	IPA	Description	Example
a	ə (601_{10})	a (97_{10})	Fore lingual, non lingual, long vowel.	ana [ana]
b	b	b	Bilabial, occlusive, voiced, noise constant.	bola [bɔla]
d	d	d	Fore lingual-alveolar, pureocclusive, voiced, noise constant.	devon [dɛvɔn]
e	e (101_{10})	ɛ (603_{10})	Fore lingual, non lingual, middle-long vowel.	elchi [ɛlʧi]
f	φ (966_{10})	f (102_{10})	Labiodentals, constrictive, voiceless.	fazo [fazɔ]
g	g	g	Shallowback lingual, occlusive, constrictive, noise constant.	gul [gʊl]
h	h	h	Glottal, constrictive, voiceless, noise constant.	haj [hadʑ]
i	i	i	Fore lingual, non lingual, short vowel.	inson [insɔn]
j (dj)	ç (231_{10})	dʑ (677_{10})	Fore lingual-glottal,affricate, voiced, noise constant.	jiyda [dʑijda]
j	ž (382_{10})	ʐ (656)	Fore lingual-glottal, constrictive, voiceless, noise constant.	jurnal [ʐʊrnal]
k	k	k	Shallowback lingual, occlusive, voiceless, noise constant.	kelin [kɛlin]
l	l	l	Fore lingual-alveolar, constrictive, noise, sonar sound.	lekin [lɛkin]
m	m	m	Bilabial, sonar, nose sound.	men [mɛn]
n	n	n	Fore lingual -alveolar, noise, sonar, nose sound.	nok [nɔk]
o	ɔ (596_{10})	ɔ (596_{10})	Back lingual, long, weak lingual vowel.	oshiq [ɔʃiq]
p	p	p	Bilabial, occlusive, voiceless, noise constant.	pashsha [paʃʃa]
q	q	q	Deepback lingual, occlusive, voiceless, noise constant.	qo‘l [qəl]
r	r	r	Fore lingual-alveolar, verbal, voiced, sonar sound.	orom [ɔrɔm]
s	s	s	Fore lingual-dental, constrictive, voiceless, noise constant.	sevgi [sɛvgi]
t	t	t	Fore lingual-alveolar, occlusive (pure occlusive), voiceless, noise constant.	tuz [tʊz]
ts (ц)	ц	ʦ (678_{10})	Fore lingual-alveolar, affricate - occlusive, voiceless, noise constant.	dotsent [dɔtsɛnt]
u	ɣ (947_{10})	ʊ (650_{10})	Back lingual, lingual, short vowels.	uchun [ʊʧʊn]
v	v	v	Bilabial, constrictive, voiced, noise constant.	vojib [vɔdʑib]
x	x	x	Deepback lingual, constrictive, voiceless, noise constant.	xola [xɔla]
y	y	j	Mediolingual, constrictive, sonar	yosh

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			constant (mouth sonar).	[jɔʃ]
z	z	z	Fore lingual-dental, constrictive, voiced, noise constant.	zeb [zɛb]
o‘	ɵ (629_{10})	ɵ (629_{10})	Back lingual, labial, middle-long, vowel.	o‘n [ɵn]
g‘	ψ (968_{10})	ʁ (641_{10})	Deepback lingual (увуляр), constrictive, voiced, noise constant.	g‘oz [ʁɔz]
sh	ş (351_{10})	ʃ (643_{10})	Fore lingual-glottal, constrictive, voiceless, noise constant.	shosh [ʃɔʃ]
ch	c	ʧ (679_{10})	Fore lingual-glottal, affricate, voiceless, noise constant..	choy [ʧɔj]
ng	ɳ (951_{10})	ŋ (331_{10})	Shallow back lingual, voiced, nose sonant.	go‘ng [gɵŋ]

If we pay attention the words (docent, magazine) acquired from Russian and other languages in the general lexicon of the Uzbek language, majority of their combinatorial and positional allophones can be combined with strong phonemes in the Uzbek language's lexicon (а, о, я, ю, ъ etc.), but the voiced constants such as “ц”, “ж” can influence on wrong pronunciation and even dividing into syllables, that’s why these letters are included in the phonetic alphabet of the Uzbek language.

III. RESULTS AND CONCLUSION

As a result, of this research, the Uzbek language phonetics software has been created [4], which helps users to learn the alphabet of the Uzbek language (with pronunciation) and phonetic analysis of around 80,000 words in the Uzbek lexicon interactively (figure 2):

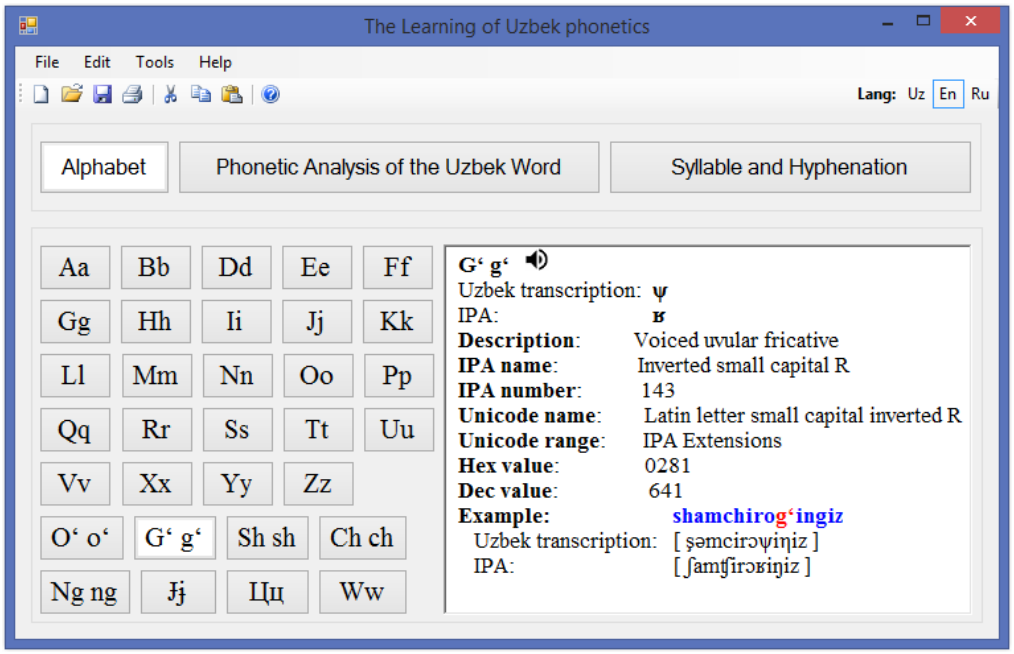

Fig2: The software for learning the Uzbek phonetics

This software has been created as a Windows application, and now its mobile version is being developed.

To sum up, the above-mentioned phonetic alphabet of the Uzbek language is of great importance in computer modeling of the phonological system of the language, computer teaching of the Uzbek language, the creation of automatic translation systems among Uzbek and other foreign languages.

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REFERENCES

[1]. AbdurahmonovaN.Z. Mashina tarjimasining lingvistik ta'minoti. Monografiya. – T.: 2018. – 188b.
[2]. Большакова Е.И. и др. Автоматическая обработка текстов на естественном языке и анализ данных. – М.: НИУ ВШЭ, 2017. – 269 с.
[3]. Миртожиев М.М.Ўзбек тили фонетикаси. – Т.: Фан, 2013. – 424 б.
[4]. Климов А. Занимательное программирование на VisualBasic .Net. – СПб.: БХВ-Петербург, 2005. – 528 с.
[5]. Interactive IPA Chart. URL: http://www.ipachart.com.
[6]. Международный фонетический алфавит. URL: http://ru.wikipedia.org.