

**THE XII INTERNATIONAL CONFERENCE ON
COMPUTER PROCESSING OF TURKIC LANGUAGES
“TURKLANG 2024”**

Proceedings

**XII МЕЖДУНАРОДНАЯ КОНФЕРЕНЦИЯ
ПО КОМПЬЮТЕРНОЙ ОБРАБОТКЕ
ТЮРКСКИХ ЯЗЫКОВ
«TURKLANG 2024»**

Труды конференции

**ТӨРКИ ТЕЛЛӨРНЕ КОМПЬЮТЕРДА ЭШКӨРТҮ
ТЕХНОЛОГИЯЛӘРЕ БУЕНЧА “TURKLANG
2024” ИСЕМЛЕ XII-НЧЫ ХАЛЫКАРА ФӘННИ
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ABSTRACT: This article discusses methods for the automatic identification of anthroponyms (personal names) as Named Entity Recognition (NER) objects. Anthroponyms not only denote human names but also reflect the history, origins, reasons for selection as personal names, and existing linguistic features. Therefore, in studying and modeling anthroponyms, methods for identifying named entities were primarily utilized. The article examines the rule-based approach employed in identifying NER objects. This research provides information on scientific studies conducted based on anthroponyms. Additionally, one of the primary characteristics of anthroponyms - the property of proper nouns and their distinction from common nouns - is presented, along with key terms within the scope of anthroponymy.

KEYWORDS: NER, name, named entity, common noun, appellative, proper noun, toponym, onomastics, linguistics, anthroponomastics, anthroponym.

INTRODUCTION

The fundamental principles of nomenclature and denomination, along with the motivations behind naming, have intrigued scholars, including linguists, since antiquity. This is evidenced by the perspectives of Heraclitus, Democritus, Plato, and Aristotle on the subject. The issue of naming objects and phenomena also captivated prominent figures in general and theoretical linguistics, such as A.A. Potebnya, I.A. Baudouin de Courtenay, and Ferdinand de Saussure. Through their theoretical insights, these scholars have made significant contributions to resolving the complexities of nomenclature [1].

Proper nouns constitute a functional-semantic class within the noun category, with their primary function being the selection and identification of objects, expressing singular and comprehensive concepts related to the subject [2]. Proper nouns represent a “re-naming” process, attributing a “new name” to the referent. They possess characteristics of specificity, uniqueness, singularity, and semantic content. In the domains of computational linguistics and Natural Language Processing (NLP), the identification of proper nouns within textual content is known as Named Entity Recognition (NER).

The process of automatically processing texts to identify named entities within their content is termed NER object identification. NER objects represent extra-lexical elements in text, specifically proper nouns. These objects encompass a range of proper nouns, including personal names, place names, organization names, and directions, among others. NER serves to identify names, disambiguate them, and correctly categorize the identified names. The initial scientific works pertaining to NER and its functions were presented at the Message Understanding Conference (MUC-6) in 1996. Subsequently,

numerous research endeavors in computational linguistics worldwide have focused on Named Entity Recognition in texts.

The scope of NER objects includes personal names, place names, organization names, addresses, directions, and various other entities. Within this array of objects, personal names - anthroponyms - constitute the most extensive category.

This translation maintains the academic tone and complexity of the original text while rendering it in English, suitable for a scholarly audience in the field of computational linguistics and onomastics.

MAIN BODY

The Concept of Anthroponym

The field of onomastics, a branch of linguistics, investigates proper nouns in language, their origins, motivational foundations, semantics, and linguistic structures. *Onomastics*, derived from Greek, literally means “the art of naming” [3]. The term onomastics is employed both to denote the linguistic discipline (a branch of lexicology) studying names and to refer to the corpus of proper names. However, it is imperative to recognize onomastics not merely as a subdivision of lexicology, but as an autonomous domain within linguistic science [4].

“Names” (proper nouns, named entities) within texts are pivotal elements that define the core content of the text. Furthermore, they constitute a crucial aspect of Natural Language Processing (NLP), specifically in the task of Named Entity Recognition (NER). Anthroponyms (personal names), identified as proper nouns, form a substantial component of NER objects and are studied within this framework.

The term anthroponym is derived from the Greek words “antros” meaning human, and “onoma” meaning name, thus signifying “personal name” [5]. This etymology elucidates that anthroponyms study the specific, unique names given to individuals - their personal appellations. The practice of human nomenclature is an ancient tradition. People have been named as a result of the need for differentiation, interpersonal identification, daily necessities, ancient customs, religious influences, cultural factors, and environmental impacts. Consequently, historically, proper nouns (names) specific to individuals have emerged.

The naming of individuals has been a longstanding tradition. People have been named due to the need for differentiation, interpersonal identification, daily necessities, ancient customs, religious influences, cultural factors, and environmental impacts. As a result, proper nouns (names) specific to individuals have emerged throughout history.

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Anthroponyms and Their Characteristics

№	Linguistic Features of Anthroponyms	Gaplar tarkibida namunalar
1	Always capitalized within sentences	“Harvard universiteti doktoranti <u>Botir Qobilov</u> o‘z Telegram-kanalida e‘lon qilgan postida vaziyatga yechim sifatida ingliz tilini ommalashtirishni taklif qilib, bu orqali nimalarga erishish mumkinligi haqida so‘z yuritdi [6].” “Harvard University doctoral student Botir Qobilov, in a post published on his Telegram channel, proposed the popularization of English as a solution to the situation, discussing potential outcomes of this approach [6].”
2	Involvement of indicators - anthroponymic determiners - in their structural formation	– “...Madrasa <u>Sharifxo‘ja</u> mablag‘i hisobiga bunyod etilgan va uning o‘zi esa umrining oxiriga qadar mazkur madrasada mudarrislik qilgan [7].” “...The madrasa was constructed using Sharifkhoja’s funds, and he himself served as a teacher in this madrasa until the end of his life [7].”
3	Can appear at any position within a sentence	“Mavloni <u>Lutfiy</u> yosh shoir <u>Navoiy</u> iste’dodiga yuqori baho bergan.”; “Yosh shoir <u>Navoiy</u> ijodiga mavloni <u>Lutfiy</u> yuqori baho bergan [8].” “Mavloni Lutfiy highly appreciated the talent of the young poet Navoi.”; “The young poet Navoi’s creativity was highly appreciated by Mavloni Lutfiy [8].”
4	Expresses the main content of the sentence	“...Sankt-Peterburg shahridagi MDH norasmiy sammiti doirasida O‘zbekiston Respublikasi Prezidenti <u>Shavkat Mirziyoyev</u> va Rossiya Federatsiyasi Prezidenti <u>Vladimir Putinning</u> uchrashuvi bo‘lib o‘tdi [9].” “...Within the framework of the informal CIS summit in Saint Petersburg, a meeting took place between the President of the Republic of Uzbekistan, Shavkat Mirziyoyev, and the President of the Russian Federation, Vladimir Putin [9].”

Types of Anthroponyms

The lexical units comprising anthroponyms include:

1. Given name
2. Surname
3. Patronymic
4. Nickname
5. Pseudonym

Names

Expression of Names in Old Uzbek

Among the upper classes, Arabic prefixes such as *Aba*, *Abul* (*Abi*, *Abon*) were used before names. These forms, derived from the Arabic word for “father,” are affixed to names in texts as *Abu*, *Abi*, *Aban*, meaning “father of...” (e.g., father of *Abulbarakat* in Arabic script). Uzbek anthroponymy includes names of Arabic origin such as *Abdulahad*, *Abulqosim*, *Abdulhay*, *Abdumansur*, *Abusaid*, *Abuturob*, where *Abu* and *Abdul* forms are fixed within the name structure.

In the history of Uzbek anthroponymy, Arabic words *ibn*, *bin*, *binni* (for boys), *bint*(*bintu*), *banot* (for girls) were used to

denote paternal lineage [10].

Ibn (Arabic: *ابن*) — a word used in male names among some Eastern peoples, including historical Turkestan. It was used in three contexts:

1. To mean “son of.” E.g., Ahmad ibn Muhammad — Ahmad, son of Muhammad.
2. To express honor and respect. E.g., Ibn Sino, Ibn Battuta.
3. To emphasize a person’s ancestry. E.g., Abul Abbas Ahmad ibn Muhammad ibn Kasir al-Farg‘oniy [11].

The word “*binni*” is similar to the modern patronymic in referencing the father, while also reminiscent of modern surnames derived from the father’s name. The use of “*binni*” in Uzbek anthroponymy persisted until the late 19th to early 20th century. For instance, in Khiva state documents, individuals were sometimes referred to using “*binni*”: Muhammad Sharif binni Muhammad [12].

Anthroponyms are structurally divided into two types:

1. **Anthropocomponent-based:** In compound names, both components are words. Such anthroponyms are formed through composition (syntactic method). Composition is the most productive method of anthroponym formation. E. Begmatov notes that out of 4600 names, 8194 are compound names [13]. Anthroponyms also contain formants – elements that form anthroponyms. Formants can take the form of affixes (suffixes) and words (lexemes). These formants are also referred to as *anthroponymic indicators* or *anthroponymic determiners*.

№	Lexemes Forming Human Names (Anthroponymic Indicators - Anthroponymic Determiners)	Resulting Name
Male Name Indicators:		
1	Boy (voy)	Odamboy
2	Bek (beg)	Alibek
3	Jon (chon)	Akmaljon
4	Xon (qon)	Odilxon
5	Toy	Toymulla, Toyqul
6	Qul	Amirqul, Suvonqul
7	Zod (zoda)	Shahzod
8	Mirza (mirzo)	Mirzamurod(Mirzoali)
9	Mulla	Mullayor
10	Murod	Murodxo‘ja
11	Mo‘min	Mo‘minmirzo
12	Shoh (shah)	Azimshoh
13	Sho(“shoh” ma‘nosida)	Shoakbar, Shoasqar
14	Sher	Sherzod, Sherbek
15	Pochcha (aka ma‘nosida)	Turdipochcha
16	Abdu(l) (abdi – arabcha “qul” ya‘ni “Allohning quli”)	Abduaziz, Abdujabbor, Abdulamin, Abdulahad
17	Abul	Abulfayz, Abulfattoh
18	Abo	Abobashr, Abobakir
19	Shayx	Shayxrozi
20	El	Elo‘g‘li, Elshod
21	Er	Erali, Erbo‘ta, Erniyoz
22	Eson	Esonboy, Esonpo‘lat
23	Esh (“do‘st” ma‘nosida)	Eshdavlat, Eshmat
24	Eshon	Eshonto‘ra, Eshonxo‘ja
25	Yuz	Yuzbek, Yuztoy
26	Yusuf	Yusufali, Yusufmirza
27	Yal (o‘zbekcha “kuchli)	Yallaboy, Yalqaboy
28	Yangi	Yangiberdi, yangiboy
29	Yaxshi	Yaxshimat, Yaxshibek
30	O‘r(a) (O‘zbekcha “yuksalsin”)	O‘ramurod, O‘rozqul, O‘rol

31	Dada	Dadabek
32	Yor	Yormuhammad
33	Nazar	Nazarmahram
34	Niyoz	Niyozxo'ja
35	Nafas	Nafasali
36	Sayyid	Sayyidhasan
37	Said	Saidato
38	Sulton	Sultonmamat
39	Sayfi	Sayfiqora
40	Safar	Safarqul
41	Tilla	Tillamirza
42	Tesha	Teshaqo'zi
43	To'xta	To'xtaxo'ja, To'xtatosh
44	To'y	To'yli, To'yberdi
45	Tosh	Toshtemir, Toshpo'lat
46	Tol	Tolmas, Tolli
47	Tangri	Tangrixo'ja, Tangriberdi
48	Tosh	Toshmurod
49	To'ra	To'ranazar, To'raniyoz
50	Hoji	Hojimurod
51	Xo'ja	Xo'janazar
52	Chori (forsha "to'rtinchi")	Choriqul, Choriniyoz
53	Xol	Xolmamat
54	Fayz	Fayzimurod, Fayzali

Female Name Indicators:

1	Bonu	Mohinabonu
2	Gul	Gulandon
3	Oy (oyim)	Oygul, Sultonoyim
4	Beka (bika)	Xolbeka, Nurbeka, Ro'zibeka, Azizbeka
5	Bibi(bu)	Bibisora, Qurbonbibi, Qurbonbu
6	Bibish	Norbibish, Gulbibish
7	Buvish	Pardabuvish, Oltinbuvish, Ortiqbuvish
8	Niso (nisa)	Xayriniso
9	Poshsha	Oyposhsha
10	Dil	Dildora, Dilrabo, Dilkusho
11	Nor	Norgul
12	Hur	Hurliqo, Hurjahon
13	Momo	Ziyoratmomo, O'sarmomo, Parimomo
14	Suluv	Zarsuluv, Ilmisuluv, Kenjasuluv
15	Go'zal	Niyozgo'zal, Norgo'zal, Nurgu'zal
16	Xonim	Durxonim, Zarxonim, Norxonim
17	Qiz	Xolqiz, Marjonqiz
18	Banot (arabcha "qiz")	Mehribanot, Nurbanot

The anthropoformants presented, when added to names, also indicate the biological gender of the name's bearer [14].

2. **Anthropoformant-based:** In this case, names consist of an independent word and an affix.

№	Suffix	Derived Anthroponym
1	-chi	To'ychi, Norchi, Ovunchi, Tinch, Ermakchi
2	-li,-lik	Begli, Berkli, Dovulli, Yozli, Ko'lli, Pirli, Tengli, Tojli, To'yli, Norli, Moyli, Norliq, Zarliq
3	-mon, -man	Oymon, Mahman, Mohmon, Toshmon, Do'lmon

4	-cha	Bodomcha, Imomcha, Inimcha, Ko'kcha, Mayramcha, Mahicha, Norcha, Nurcha, Oymacha, Oycha, Oy xoncha, Olmacha, Oltincha, Ko'rboncha, Tugalmacha, To'goncha, Ulug'cha, Ulcha, Umirchaxon, Usmoncha, O'rincha, Bo'zcha, Boycha, Toyibcha
5	-gon, -gan, qon, -kan,	O'sgan, Topgan, Turg'on, To'ragon
6	-ak	Ko'sak, Ko'chak
7	-chin	Barchin, Olchin
8	-q, -iq	Topildiq, Sog'indiq, Quvondiq, Topdiq
9	-lan, -lon	To'ylan, Boglon, Toylon.
10	-mish	To'lamish, To'xtamish
11	-don	Uldon, Obodon
12	-a	Anora, Begima, Zilola, Kamola
13	-ya(-iya)	Avjiya, Azmiya, Ahliya, Zavqiya, Mohiya, Noriya, Husniya, Oliya
14	-illo(-ullo)	Ruhullo
15	- b a c h c h a (- vachcha)	Nig'matbachcha

According to E. Begmatov, in his book "The Meaning of Uzbek Names" [15], the suffix -a (which forms the feminine gender in Uzbek) [16] appears in 433 female names, while -ya(-iya) occurs in 172 female names. These suffixes, indicative of biological gender, function as indicators and are predominantly affixed to names borrowed from Arabic or to names formed in Uzbek and Tajik languages based on Arabic lexemes.

Furthermore, name formation also involves the direct transference of root, simple stem, derived stem, and compound stem appellatives to function as names through transnominatation. This method is termed lexical-semantic formation. In this process, as the appellative transitions to a name, it undergoes no changes at the onomastic level and is directly employed as a name. Such appellatives are frequently found in the adjectival word class (For example: Yorqin, Mengli, Risliq, Go'zal, Nozik, Sokina, Jo'shqin, Botir, Shirin, Totli, Erkin, Shodon).

Once these forms assume the function of names, they acquire the character of a formally unified name – an anthroponym – within the realm of onomastics, and their previous derivational state ceases. However, it is crucial to distinguish two aspects: the fact that the name is derived from a previously derived word (appellative) and that the name formation occurs within the domain of onomastics [17].

In the lexical-semantic method of name formation, the principles of substantivization [18] and adverbialization [19] are operative. This is because any word transitioning to the function of a name detaches from its previous morphological category and shifts to the noun (proper noun) category.

To differentiate anthroponyms formed through the lexical-semantic method from identical common nouns, the "Capital letter" model is employed. Names (anthroponyms) are identified by recognizing capitalized words within sentences. If the model, relying on the capitalization rule, simultaneously identifies several types of NER objects, such as anthroponyms and toponyms, it necessitates the second part of NER object identification methods: correctly categorizing the identified NER objects. In this case, another approach, the Dictionary-based approach, is utilized. NER objects are then identified using dictionary databases ("Name Dictionary", "Place Name Dictionary").

№	Appellative Form	Appellatives	Anthroponyms
1	Root	jasur muqaddas	Jasur Muqaddas
2	Simple stem	tuhfa mardona	Tuhfa Mardona
3	Derived stem	ulansin tursun yaxshilik	Ulansin Tursun Yaxshilik
4	Compound stem (c o m p o u n d word or phrase form)	Eshpo‘lat Yovqochar	Eshpo‘lat Yovqochar

This table demonstrates the process of transnominatation in Uzbek anthroponymy, where common nouns (appellatives) are directly converted into personal names (anthroponyms). The table is organized according to the morphological complexity of the appellatives:

1. Root words: Simple, underived words.
2. Simple stems: Words without any derivational affixes.
3. Derived stems: Words formed with derivational affixes.
4. Compound stems: Words or phrases formed by combining two or more words.

In each case, the appellative is shown alongside its corresponding anthroponym, which is identical in form but functions as a proper name. This illustrates the lexical-semantic method of name formation in Uzbek, where the transition from common noun to proper name occurs without any formal change to the word itself.

Surname

A surname (from Latin: familia — family) is a family name adopted at birth, adoption, change of previous surname, or marriage, and passed down from generation to generation. It typically accompanies personal names and indicates a person's lineage. In ancient Rome, it also encompassed the economic and legal relationships of a family, including both blood relatives and slaves.

Early surnames were formed by referencing the place of birth or the location of a person's "ancestral heritage". The use of surnames became customary in Western Europe from the 15th century, primarily spreading among the upper classes. In the past, Uzbeks did not have surnames in the modern sense. However, means of indicating family and paternal names have long existed. From the 6th-7th centuries, words like "son of" or "daughter of" were added after the father's name (e.g., Bayna Sangnun o'g'li). Later, influenced by Arabs, Arabic words like "ibn" (son) (e.g., Ahmad ibn Muhammad) and "bint" (daughter) were used. These methods of surname formation later also created the form of patronymics.

In the 1920s-1930s, Uzbek surnames were mainly in the form of Ahmad Fozil o'g'li, Xakima Fozil qizi. Among intellectuals, suffixes like "zoda" (Hamza Hakimzoda, Turg'un Sharifzoda), "iy", "viy", "iya", "viya" (Abdulla Qodiriy, Abdulla Alaviy, Mirzakalon Ismoiliy, Muzayyana Alaviya) were used to create surname-pseudonyms. Sometimes, names were used without suffixes: Parda Tursun, Sulton Jo'ra, Ilyos Muslim.

Arabic naming methods persisted in Uzbek anthroponymy until the late 19th - early 20th century but became archaic after Russian-style surnames became common.

The earliest examples of Uzbek surnames in Russian form appear in 17th-18th century historical documents. For example: Borbo'sin Shuraliyev (Borbo'sin Sheraliyev, Khiva

ambassador, 1644), Davlat Muhammad Shukurov (Khiva khan's messenger, 1658), Darvish Baba Yeriyeu (Darvesh bobo Yorov) - Khivan karnonboshi; Nodir - Bexadur Kurmametov (Nodir Bahodir Qurmatov, Khiva ambassador, 1678) and others. This doesn't mean Russian-style surnames were common among Uzbeks from the 16th century. Surnames and patronymics officially emerged only when they became applicable to the general public.

Uzbek surnames are formed by adding Russian suffixes -ov, -yev (for men), -ova, -yeva (for women) to the father's or grandfather's name. For example: Alimov Sardor; Shermatova Lobar.

Professor N.G. Malliskiy wrote that Russian-style surnames began to become customary among Uzbeks from 1928.

In modern Uzbek, Russian-style surnames are mainly formed from two sources: 1) father's name; 2) grandfather's name. The correct method of forming a surname is actually grandfather's name + personal name and father's name. However, in Uzbek, surnames have been formed from both grandfather's and father's names according to personal preference. In some cases, both the surname and patronymic were formed from the grandfather's or father's name: G'ulomov Fathulla G'ulomovich, Ismoilov Aziz Ismoilovich, Asqarova Mazluma Asqarovna, Xudoyberganova Nurposhsha Xudoyberganovna. When women change their maiden name to their husband's surname, their surname changes, but the patronymic remains: e.g., Begmatova Muhabbat O'rinboyevna. During the Soviet era, a three-part naming system (surname, personal name, and patronymic) was officially introduced for Uzbeks.

Between 1930-1940, citizens were referred to using surnames formed by both methods. Even in the Uzbek grammar books published at that time, information about forming surnames using Russian affixes -ov, -ova, -yev, -yeva was provided and written about.

Patronymic (Father's Name)

A patronymic is a form of name that adds a certain suffix or word to the father's name, intended to complete and specify a person's name. The patronymic is also a lexical unit of anthroponymy.

The word *sharif* in Arabic is used to mean *sacred, dear, blessed*. "Ismi sharif" means *dear name, blessed name* (For example, "I, O'tabboy qushbegi, the governor of Margilan, proclaim my decree in the name of His Excellency Khudoyorkhan, the khan of khans") [21].

Patronymics and surnames differ in terms of their longevity. Usually, a full surname is enduring and stable. A surname passes from generation to generation, serving as a traditional name for several generations. A patronymic, however, changes from father to father [22]. Since the term patronymic (отчество) is derived from the word "отец" (father), V. Dal explains it as *naming a person after their father* [23].

Patronymics serve a threefold purpose: *they complement the name, distinguish the bearer from others with the same name (in addition to the surname), and identify family relationships (father-son) and show respect (in form)* [24].

In the Uzbek language, patronymics are formed in two ways:

1. By adding the words "o'g'li" (*son of*) or "qizi" (*daughter of*) after the father's name. For example: Rixsiyev Uchqun Alisher o'g'li; Fazliddinova Sayyora Botir qizi
2. By adding the Russian suffixes -ovich or -ovna after

the father's name. For example: Yunusov Abdulla Odilovich; Sayfiyeva Zebo Xurshidovna

The words "o'g'li" and "qizi" in Uzbek anthroponymic history were mainly derived from names meaning father's name. This is because these words were added to the name of the person's father. Some citizens prefer forms consisting of name and patronymic or grandfather's name without Russian suffixes (like Murad Abdulla, Zebo A'zam). Some intellectuals use forms consisting of name and birthplace name or clan, tribe name.

In the history of the Uzbek language, surnames were formed using the grandfather's name, and in some cases, the father's name. In such cases, the surname and patronymic were expressed in the same form. For example: Turg'unov Sarvar Turg'unovich; Ilyosova Guljahon Ilyosovna.

CONCLUSION

In the world around us, all beings, things, animate and inanimate nature are named as a result of their tendency to differentiate and individualize. These names are so numerous that it's difficult to comprehend them all at once. Although objects are united under general names (categories), they are renamed based on other "names" due to their structure, characteristics, belonging to a particular category, and properties. It may be easy to distinguish named entities within a text at a glance, but this is not always the case. In the computer age, performing this task automatically ensures time efficiency and effective results.

Anthroponyms (human names), which are part of NER objects, have been studied within the field of onomastics in linguistics. Identified names have been collected, compiled into special dictionaries, and published. However, specific models for automatically identifying these units during text analysis have not been developed.

During the research process, anthroponyms were grammatically analyzed. They were divided into two groups based on anthropocomponents and anthropoformants. Indicators and affix additions occurring within names were identified. Models based on indicators and affixes were presented. Names were analyzed in three forms: given name, surname, and patronymic.

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