

ALISHER NAVOIY NOMIDAGI TOSHKENT DAVLAT O'ZBEK TILI VA
ADABIYOTI UNIVERSITETI HUZURIDAGI ILMiy DARAJALAR
BERUVCHI DSc.03/30.12.2019.Fil.19.01 RAQAMLI ILMiy KENGASH
ASOSIDAGI BIR MARTALIK ILMiy KENGASH

ALISHER NAVOIY NOMIDAGI TOSHKENT DAVLAT O'ZBEK TILI VA
ADABIYOTI UNIVERSITETI

XONNAZAROV ELYOR G'OFUROVICH

O'ZBEK TILI KORPUSI UCHUN ZAMONNI IFODALOVCHI
GRAMMATIK SHAKLLARNI ANNOTATSİYALASH

10.00.11 – Til nazariyasi, Amaliy va kompyuter lingvistikasi

FILOLOGIYA FANLARI BO'YICHA FALSAFA DOKTORI (PhD)
DISSERTATSİYASI AVTOREFERATI

Toshkent–2023

Filologiya fanlari bo'yicha falsafa doktori (PhD)
dissertatsiyasi avtoreferati mundarijasi

Contents of dissertation of sciences of the doctor of philosophy (PhD)
on philological sciences

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по филологическим наукам

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Toshkent-2023

Falsafa doktori (PhD) dissertatsiyasi mavzusi O'zbekiston Respublikasi Ohiy ta'lim, fan va innovatsiyalar vazirligi huzuridagi Ohiy attestatsiya komissiyasida B2021.2.PhD/P/1096 raqam bilan ro'yxatga olingan.

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Dissertatsiya bilan Alisher Navoiy nomidagi Toshkent davlat o'zbek tili va adabiyoti universitetining Axborot-resurs markazida tashrifi shartkor. QR raqam bilan to'xtatga olingan) Manzil: 100100, Toshkent shahri, Yakkasaroy tumani, Yasaf Xov Hojib ko'chasi, 103. Tel.: (99871)281-42-44, fax: (99871)281-42-44, (www.tsuall.uz).

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KIRISH (falsafa doktori (PhD) dissertatsiyasi annotatsiyasi)

Dissertatsiya mavzusining dolzarbligi va zarurati, jahonda axborot texnologiyalarini tilshunoslikka tatbiq etish bilan bog'liq ilmiy yo'nalishlar XX asrning 40-yillaridan rivojlanib boshladi. Buning natijasida mashina tarjimasini, kompyuter lingvistikasi, korpus lingvistikasi kabi yo'nalishlar vujudga keldi. Mazkur yo'nalishlarning tahlil tizimlari uchun esa formal grammatikani ishlab chiqish zarurati paydo bo'ldi. XX asrning 50-yillariga kelib avtomatik morfologik tahlil tizimlari ishlab chiqildi va ulardan tabiiy tilga ishlov berish hamda mashina tarjimasini sohalarda foydalanila boshlandi. Natijaning zamonga munosabatini belgilash morfologik tahlil jarayonida muhim ahamiyat kasb etadi. Fazo va vaqt bo'liqning fundamental shakli hisoblanib, har qanday axborot, harakat, holat zamon va mkan belgilariga ega. Axborotning davrga munosabatini tushunish dunyoqadagi o'zgarishlarni anglashning muhim sharti hisoblanadi. Zamon orqali muayyan hodisa yoki holatlarning sodir bo'lgan payti bayin elladi, bu orqali ular xotirada ketma-ketlikda tartiblanadi, shuningdek, ularning qancha muddat davom etganligi belgilanadi. Axborotning zamonga munosabatini anglatuvchi tahlillar avtomatik amalga oshirilishini ta'minlash zarurati zamon grammatik shakllarini annotatsiyalash masalasining amaliy ahamiyatini oshiradi.

Dunyo tilshunosligida XX asr oxirlarida til korpuslarini tuzish va ularni lingvistik annotatsiyalash dolzarb masalalardan biriga aylandi. Bu esa har bir tilga oid so'zlarni, grammatik shakllarni tashlashning dasturiy va lingvistik ta'minotini yaratishni kum tartibiga qo'ydi. Natijada, XXI asrga kelib millionlab so'zlarni o'z ichiga olgan til korpuslari paydo bo'ldi. Ularning aksariyati korpus tarkibidagi axborotning qaysi vaqtga ishora qilayotganligini zamoni (fidallovchi grammatik shakllar va vaqt ma'noli lug'aviy birliklarga ko'ra) tahlil qilish imkoniyatiga ega. Bugungi kunda fe'l zamonining ko'chishi, kontekst ta'sirida boshqa bir zamonga ishora qilishi kabi masalalarni avtomatik tahlilda aniqlash jabon korpus lingvistikani oldidagi muhim vazifalardan biri bo'lib turibdi.

O'zbek tilshunosligida XXI asr boshlaridan kompyuter lingvistikasi yuzasidan tadqiqotlar amalga oshirila boshlandi. Dastlabki tadqiqotlar jabon kompyuter lingvistikasi yutuqlari asosida o'zbek tili lingvistik va leksikografik tadqiq etish bilan bog'liq bo'lsa, so'ngi yillarda bevosita o'zbek tiling milliy va shaxsiy korpuslarini tuzish, morfologik, sementik analizator dasturlarini ishlab chiqish masalalariga alohida e'tibor berilmoqda. Ayniqsa, davlat tilining axborot texnologiyalari va kommunikatsiyalariga faol integratsiyalashuvini ta'minlash va o'zbek tiliga oid barcha ilmiy, nazariy va amaliy ma'lumotlarni o'zida jamlagan elektron ko'rinishdagi o'zbek tili milliy korpusini yaratish vazifalari qo'yilgach, bu sohada ishlar yanada jadallashdi. Biroq yarim asrdan uzoq vaqt davomida olib borilgan tadqiqotlar natijasida to'plangan lingvistik ma'lumotlarni til korpusi uchun lingvistik ta'minotga aylantirish hozirgacha amalga oshirilgan bir necha tadqiqotlar doirasida qamrab olinishi mumkin bo'lgan vazifa emas. Ma'lumotlarni muayyan

maqsad yo'lida qayta ishlay olish va ularni inson faoliyatining turli jabhalariга jadal sur'atlar bilan taqqoslashda dunyodagi hech qaysi vosita kompyuterlariga tenglasha olmaydi. Bugun dunyoda foydalanilayotgan mukammal annotatsiyalanmagan til korpuslarining analizi ahamiyati va boy imkoniyatlarini hisobga oladigan bo'lsak, milliy tilimizda ham shunday korpusning tuzilishi uchun o'zbek tilining har bir kategoriyasini o'ziga xosligidan kelib chiqqan holda lingvistik annotatsiyalash yuzasidan tadqiqotlar olib borishga ehtiyoj bor. Ta'kidlash jozibki, amalda tuzilayotgan o'zbek tili korpuslarida zamoni aniqlatuvchi barcha grammatik shakllar to'liq lingvistik annotatsiyalanmagan. Shuningdek, o'zbek tili korpusi uchun zamoni ifodalovchi grammatik shakllarni annotatsiyalash masalasi shu vaqtgacha morfografik planda tadqiq qilinmaganligi mavzuning dolzarbligini belgilaydi.

O'zbekiston Respublikasi Prezidentining 2016-yil 13-maydagi PF-4997-son tasdiqlash orqali qabul qilingan Davlat o'zbek tili va adabiyoti universitetini davlat tili sifatidagi nufuzi va mavqeyini tubdan oshirish chora-tadbirlari to'g'risida, 2020-yil 20-oktabrdagi PF-6084-son "Mamlakatimizda o'zbek tili yuzasida rivojlantirish va til siyosatini takomillatirish chora-tadbirlari to'g'risida", 2020-yil 29-oktabrdagi PF-6097-son "Ilim-fan 2030-yilgacha rivojlantirish konsepsiyasini tasdiqlash to'g'risida", 2022-yil 28-yanvardagi PF-60-son "2022-2026-yillarga mo'ljallangan Yangi O'zbekistonning taraqqiyot strategiyasi to'g'risida"gi qararlari va 2019-yil 4-oktabrdagi PQ-4479-son "O'zbekiston Respublikasining "Davlat tili haqida"gi Qonun qabul qilinganligining o'tuz yilligini keng nishonlash to'g'risida"gi Qarori va mazkur faoliyatga tegishli boshqa me'yoriy-huquqiy hujjatlarda belgilangan vazifalarni amalga oshirishda ushbu dissertatsiya ishi muayyan darajada xizmat qiladi.

Tadqiqotning respublika fan va texnologiyalar rivojlanishining ustuvor yo'nalishlariga mosligi. Dissertatsiya respublika fan va texnologiyalar rivojlanishining 1."Asboblashgan jamiyat va demokratik davlatni ijtimoiy, huquqiy, iqtisodiy, madaniy, ma'naviy-ma'rifiy rivojlantirishda innovatsion g'oyalari tizimini shakllantirish va ularni amalga oshirish yo'llari" ustuvor yo'nalishlariga muvofiq bajarilgan.

Muammoning o'rganilgan darajasi. Jahon tishunosligida lingvistik universaliya bo'lgan zamon kategoriyasi tadqiqi turli aspektlarda amalga oshirilgan. Zamon fe'lining grammatik kategoriyasi sifatida tadqiq qilingan ishlar sirasiga H.Reichenbach, H.Veinrich, Z.Vendler, A.V.Bondarko, N.Hornstein, J.Allen, K.Mori-kum Yip, I.V.Kornushin, B.Komri, V.Kornecvaya, A.O.Kozmin, A.A.Ziyavodina kabi olimlarning ishlarini misol sifatida keltirish mumkin.

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2. Reichhold H. The Tenses of Verbs. - New York. The Macmillan Company, 1943. - P. 287-289. Wazirah H. Tenses. - *Representations and English Words*. - Stuttgart, 1964. - Vindler Z. Linguistics in Philology (Verbs and time). - New York: Cornell University Press, 1967. - P. 97-121. Binns A. Temporal reference in language. - *The Yearbook*, 1971. - 141 s. Hornstein N. Towards a Theory of Tense. *Linguistics Inquiry*. - 1973. - 36 X. - P. 521-532. Allen J. Tenses. - *General Theory of Action and Time*. Artificial intelligence. - 1996. - 36 X. - P. 123-131. Mori-kum Yip K. Tense, Aspect and the Cognitive Representation of Time. - *Microsoft Institute of Technology*, 1994. - P. 36. Kornushin I. *Словосочинение в русском языке*. - М.: Высш. шк., 1984.

Jahon korpus lingvistikasida zamon shakllarini razmekaflash yuzasidan olib borilgan tadqiqotlarning aksariyati J.Pytajevskiyning Time ML annotatsiya sxemasiга asoslanadi. Bunda ishlar sirasiga M.Vetshagen, G.Marsik, N.UzZaman, L.Bierkaund, V.Gast kabi olimlarning tadqiqotlarini kiritish mumkin. Ushbu tadqiqotlarda faqat muayyan grammatik shakllar orqali ifodalangan zamon ma'nosi emas, balki turli vaqt ma'nolari tug'uvchi birliklar, shuningdek, birliklar va gaplarning o'zaro munosabatidan kelib chiqadigan zamon ma'nosini modellashtirish masalalari ham o'rganilgan.

Rus korpus lingvistikasida V.P.Zaxarov, S.Y.Beglanova, A.B.Kutuzov, Y.V.Nedoshvina, D.Y.Gruzdev, I.O.Kuznetsov, I.M.Nojov kabi olimlarning tadqiqotlari korpus va uning tuzilishi, razmeka standartlari, matnning avtomatik morfoloqik va sintaktik tablarni amalga oshirish kabi masalalarga e'tibor qarabilmagan bilan ahamiyatlidir.

Turkologiya zamoni ifodalovchi shakllarni annotatsiyalash masalasi umumiy morfoloqik razmekaflash, avtomatik morfologik tablarni amalga oshirish doirasida o'rganilgan. A.V.Dibo va A.V.Sheyrovich² (turkiy tillar, xususan, xakas tili), E.Adali, K.Oflazer³ (turk tili), D.Sh.Soleymanov, A.R.Gil'mullin, R.R.Galullin⁴ (fatar tili), G.G.Fortoyev, A.N.Nogovitsina⁵ (yoqut tili), A.B.Xerteq, B.Ch.Orjak⁶

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(tuva tili), P.B. Jeltov¹¹ (chuvash tili), N.A. Isroilova, P.S. Bakasova¹² (qirg'iz tili) avtomatik morfologik tahlilni amalga oshirish, morfologik analizator ishlab chiqish masalalarini tadqiq etganlar.

O'zbek tishunosligida zamon kategoriyasi ancha keng o'rganilgan masalalardan biri. O'zbek tili grammatikasi, xususan, morfologiyasi yuzasidan olib borilgan tadqiqotlar, yozilgan turli darslik va qo'llanmalar mualliflari to'liq so'z turkumi doirasida zamonni ifodalovchi shakllar va ularning tasnifi masalasiga ham to'xtalgan. Bu borada, ayniqsa, Abduraf Fitrat, A.G'ulomov, A.Hojiyev, A.Kononov, Sh.Shukurov, J.Jo'rayeva, A.Sulaymonov, Y.Tojiyev, G'Zikrilloev, B.Mengliyev, Z.Xudayberganova, Sh.Shaxobidinova, N.Musulmonova, Sh.Sultonovalarning tadqiqotlari muhim ahamiyatga ega¹³. Shuningdek, o'zbek tilida vaqt ma'noli lug'aviy birliklar va ularning matn shakllantirish imkoniyatlari M.Hakimova tomonidan atroflicha o'rganilgan¹⁴.

O'zbek tishunosligida kompyuter lingvistikasi, ma'niga leksikografik ishlov berish va lingvostatistik tahlil etish borasida birmuncha tadqiqotlar amalga oshirilgan. A.Po'latov, S.Muhamedov, M.Ayimbetov, S.Muhamedova, S.Karimov, G.Jumanazarova, D.O'rinboeva, N.Abdurahmonova, A.Norov va boshqalarning tadqiqotlari ana shunday ishlar sirasiga kiradi¹⁵. Maxsus o'zbek lingvistik

korpuslarini tuzish va ularni tglash masalasi Sh.Hamroyeva, N.Abdurahmonova, M.Abbalova, A.Eshmo'minov, O'Xaliyovov, Sh.Gulyanova, O.Abdullayeva, D.El'ovri kabrlarning tadqiqotlarida hayon qtingan¹⁶. Sh.Hamroyevaning "O'zbek tili morfologik analizatorning lingvistik ta'minoti" mavzusidagi doktoralik dissertatsiyasida til kategoriyalarini avtomatik morfologik tahlilni amalga oshirishning umumiy tamoyillari belgilab berilgan. N.Abdurahmonova O'zbek tili elektron korpusi (uzbekcorpus.uz)ga asoslanib, matnlarni morfologik tglash va tahlil qilishda F'SF (Finite state transducer – chekli avtomat transyutiri) texnologiyasi imkoniyatlarini tadqiq qiladi¹⁷.

Tadqiqotning dissertatsiya bajarilgan o'liy ta'lim muassasasi ilmiy-tadqiqot ishlari rejalari bilan bog'liqligi, Dissertatsiya Alisher Navoiy nomidagi Toshkent davlat o'zbek tili va adabiyoti universitetining ilmiy-tadqiqot rejasiga muvofiq "Kompyuter va korpus tishunosligi" mavzusi doirasida bajarilgan.

Tadqiqotning maqsadi o'zbek tili korpusi uchun tilda mavjud zamonni ifodalovchi grammatik shakllarni modellashtirish va annotatsiyalashni asoslashdan iborat.

Tadqiqotning vazifalari:

jahon tishunosligi va o'zbek tishunosligida zamon kategoriyasi tadqiqini o'rganish;

o'zbek tilida zamon kategoriyasi yuzasidan olib borilgan tadqiqotlarda erishilgan yutuqlardan korpusda zamon shakllarini annotatsiyalashta lingvistik ta'minot sifatida foydalanish imkoniyatlarini aniqlash;

zamonni annotatsiyalashning turli darajalarini ajratish;

har bir zamonni ifodalovchi grammatik shakliga uni boshqa zamon shakllaridan farqlovchi sharti belgi va annotatsiya birkitirish;

zamon shakllarining morfolaktik qoidalarini asosida modellar ishlab chiqish;

zamon shakllarini annotatsiyalashta eronimlik va ko'p ma'nolilik holatlarini furqlash.

Tadqiqotning obyektli. O'zbek tilida zamonni ifodalovchi grammatik shakllar tadqiqot obyektli hisoblanadi. Bunda zamon grammatik shakllariga oid tahlillar

¹¹ Jeltov P.B. Morfoloqiyaviy avtomatizatsiya kompyuter lingvistikasi, ma'niga leksikografik ishlov berish va lingvostatistik tahlil etish borasida birmuncha tadqiqotlar amalga oshirilgan. A.Po'latov, S.Muhamedov, M.Ayimbetov, S.Muhamedova, S.Karimov, G.Jumanazarova, D.O'rinboeva, N.Abdurahmonova, A.Norov va boshqalarning tadqiqotlari ana shunday ishlar sirasiga kiradi. Maxsus o'zbek lingvistik korpuslarini tuzish va ularni tglash masalasi Sh.Hamroyeva, N.Abdurahmonova, M.Abbalova, A.Eshmo'minov, O'Xaliyovov, Sh.Gulyanova, O.Abdullayeva, D.El'ovri kabrlarning tadqiqotlarida hayon qtingan. Sh.Hamroyevaning "O'zbek tili morfologik analizatorning lingvistik ta'minoti" mavzusidagi doktoralik dissertatsiyasida til kategoriyalarini avtomatik morfologik tahlilni amalga oshirishning umumiy tamoyillari belgilab berilgan. N.Abdurahmonova O'zbek tili elektron korpusi (uzbekcorpus.uz)ga asoslanib, matnlarni morfologik tglash va tahlil qilishda F'SF (Finite state transducer – chekli avtomat transyutiri) texnologiyasi imkoniyatlarini tadqiq qiladi.

¹² Bakasova P.S. O'zbek tili qoidalarini yuzasida bir qancha ta'limlangan talimlar. Toshkent: Maktab, 2009. – 154-161; Tojiyev Y. O'zbek tili grammatikasi, xususan, morfologiyasi yuzasidan olib borilgan tadqiqotlar, yozilgan turli darslik va qo'llanmalar mualliflari to'liq so'z turkumi doirasida zamonni ifodalovchi shakllar va ularning tasnifi masalasiga ham to'xtalgan. Bu borada, ayniqsa, Abduraf Fitrat, A.G'ulomov, A.Hojiyev, A.Kononov, Sh.Shukurov, J.Jo'rayeva, A.Sulaymonov, Y.Tojiyev, G'Zikrilloev, B.Mengliyev, Z.Xudayberganova, Sh.Shaxobidinova, N.Musulmonova, Sh.Sultonovalarning tadqiqotlari muhim ahamiyatga ega. Shuningdek, o'zbek tilida vaqt ma'noli lug'aviy birliklar va ularning matn shakllantirish imkoniyatlari M.Hakimova tomonidan atroflicha o'rganilgan.

¹³ Abduraf Fitrat. O'zbek tili qoidalarini yuzasida bir qancha ta'limlangan talimlar. Toshkent: Maktab, 2009. – 154-161; Tojiyev Y. O'zbek tili grammatikasi, xususan, morfologiyasi yuzasidan olib borilgan tadqiqotlar, yozilgan turli darslik va qo'llanmalar mualliflari to'liq so'z turkumi doirasida zamonni ifodalovchi shakllar va ularning tasnifi masalasiga ham to'xtalgan. Bu borada, ayniqsa, Abduraf Fitrat, A.G'ulomov, A.Hojiyev, A.Kononov, Sh.Shukurov, J.Jo'rayeva, A.Sulaymonov, Y.Tojiyev, G'Zikrilloev, B.Mengliyev, Z.Xudayberganova, Sh.Shaxobidinova, N.Musulmonova, Sh.Sultonovalarning tadqiqotlari muhim ahamiyatga ega. Shuningdek, o'zbek tilida vaqt ma'noli lug'aviy birliklar va ularning matn shakllantirish imkoniyatlari M.Hakimova tomonidan atroflicha o'rganilgan.

¹⁴ Hakimova M. O'zbek tili qoidalarini yuzasida bir qancha ta'limlangan talimlar. Toshkent: Maktab, 2009. – 154-161; Tojiyev Y. O'zbek tili grammatikasi, xususan, morfologiyasi yuzasidan olib borilgan tadqiqotlar, yozilgan turli darslik va qo'llanmalar mualliflari to'liq so'z turkumi doirasida zamonni ifodalovchi shakllar va ularning tasnifi masalasiga ham to'xtalgan. Bu borada, ayniqsa, Abduraf Fitrat, A.G'ulomov, A.Hojiyev, A.Kononov, Sh.Shukurov, J.Jo'rayeva, A.Sulaymonov, Y.Tojiyev, G'Zikrilloev, B.Mengliyev, Z.Xudayberganova, Sh.Shaxobidinova, N.Musulmonova, Sh.Sultonovalarning tadqiqotlari muhim ahamiyatga ega. Shuningdek, o'zbek tilida vaqt ma'noli lug'aviy birliklar va ularning matn shakllantirish imkoniyatlari M.Hakimova tomonidan atroflicha o'rganilgan.

¹⁵ Po'latov A.P., Muhamedov S.M., Ayimbetov M., Muhamedova S., Karimov S., Jumanazarova G., O'rinboeva D., Abdurahmonova N., Norov A. O'zbek tili grammatikasi, xususan, morfologiyasi yuzasidan olib borilgan tadqiqotlar, yozilgan turli darslik va qo'llanmalar mualliflari to'liq so'z turkumi doirasida zamonni ifodalovchi shakllar va ularning tasnifi masalasiga ham to'xtalgan. Bu borada, ayniqsa, Abduraf Fitrat, A.G'ulomov, A.Hojiyev, A.Kononov, Sh.Shukurov, J.Jo'rayeva, A.Sulaymonov, Y.Tojiyev, G'Zikrilloev, B.Mengliyev, Z.Xudayberganova, Sh.Shaxobidinova, N.Musulmonova, Sh.Sultonovalarning tadqiqotlari muhim ahamiyatga ega. Shuningdek, o'zbek tilida vaqt ma'noli lug'aviy birliklar va ularning matn shakllantirish imkoniyatlari M.Hakimova tomonidan atroflicha o'rganilgan.

¹⁶ Hamroyeva S.H. O'zbek tili grammatikasi, xususan, morfologiyasi yuzasidan olib borilgan tadqiqotlar, yozilgan turli darslik va qo'llanmalar mualliflari to'liq so'z turkumi doirasida zamonni ifodalovchi shakllar va ularning tasnifi masalasiga ham to'xtalgan. Bu borada, ayniqsa, Abduraf Fitrat, A.G'ulomov, A.Hojiyev, A.Kononov, Sh.Shukurov, J.Jo'rayeva, A.Sulaymonov, Y.Tojiyev, G'Zikrilloev, B.Mengliyev, Z.Xudayberganova, Sh.Shaxobidinova, N.Musulmonova, Sh.Sultonovalarning tadqiqotlari muhim ahamiyatga ega. Shuningdek, o'zbek tilida vaqt ma'noli lug'aviy birliklar va ularning matn shakllantirish imkoniyatlari M.Hakimova tomonidan atroflicha o'rganilgan.

¹⁷ Abdurahmonova N.A. O'zbek tili grammatikasi, xususan, morfologiyasi yuzasidan olib borilgan tadqiqotlar, yozilgan turli darslik va qo'llanmalar mualliflari to'liq so'z turkumi doirasida zamonni ifodalovchi shakllar va ularning tasnifi masalasiga ham to'xtalgan. Bu borada, ayniqsa, Abduraf Fitrat, A.G'ulomov, A.Hojiyev, A.Kononov, Sh.Shukurov, J.Jo'rayeva, A.Sulaymonov, Y.Tojiyev, G'Zikrilloev, B.Mengliyev, Z.Xudayberganova, Sh.Shaxobidinova, N.Musulmonova, Sh.Sultonovalarning tadqiqotlari muhim ahamiyatga ega. Shuningdek, o'zbek tilida vaqt ma'noli lug'aviy birliklar va ularning matn shakllantirish imkoniyatlari M.Hakimova tomonidan atroflicha o'rganilgan.

¹⁸ Abdurahmonova N.A. O'zbek tili grammatikasi, xususan, morfologiyasi yuzasidan olib borilgan tadqiqotlar, yozilgan turli darslik va qo'llanmalar mualliflari to'liq so'z turkumi doirasida zamonni ifodalovchi shakllar va ularning tasnifi masalasiga ham to'xtalgan. Bu borada, ayniqsa, Abduraf Fitrat, A.G'ulomov, A.Hojiyev, A.Kononov, Sh.Shukurov, J.Jo'rayeva, A.Sulaymonov, Y.Tojiyev, G'Zikrilloev, B.Mengliyev, Z.Xudayberganova, Sh.Shaxobidinova, N.Musulmonova, Sh.Sultonovalarning tadqiqotlari muhim ahamiyatga ega. Shuningdek, o'zbek tilida vaqt ma'noli lug'aviy birliklar va ularning matn shakllantirish imkoniyatlari M.Hakimova tomonidan atroflicha o'rganilgan.

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O'zbek tiliining ta'limiy korpusi (uzschoolcorpara.uz) matnlariga asoslangan holda amalga oshiriladi.

Tadqiqot predmetini o'zbek tilida zamonaviy ifodalovchi grammatik shakllarni lingvistik ta'minot sifatida tizimlashtirish va ularni annotatsiyalash masalalari tashkil etadi.

Tadqiqotning usullari. Tadqiqot mavzusini yoritishda tasviflash, tavsiflash, qiyyoslash, modellashtirish metodlaridan foydalanildi.

Tadqiqotning ilmiy yangiligi quyidagilardan iborat:

o'zbek tilida zamon ifodalovchi grammatik shakllarning boshqalaridan farqlanuvchi bevosita kuzatganlik yoki bilvosita xabar topganlik, statik yoki dinamik harakat-holatlar uchun xoslanganlik, subyektaga urg'u berish, nutq momentiga bilvosita bog'lanish kabi xususiyatlari aniqlangan;

zamonni annotatsiyalashning grammatik, semantik va kontekstual darajalari ajratilib, davomli zamon qo'shimchalarini qabul qilishda fe'l leksik ma'nosining ta'siri o'chib berilgan, zamonni annotatsiyalashning kontekstual darajasi aniqlangan; zamon shakllarining tilda vaziyatlarga oid qo'llanilishlari va nuqtda faollik darajasi har xilining og'zaki yoki yozma nuqtda uchrashi, badiiy uslub uchun xoslanganligi, tarixiylashayotganligi kabi sabablari o'chib berilgan;

zamon shakllarini annotatsiyalash jarayonida yuzaga keladigan grammatik shakllarning omimligi va ko'p ma'noiligi bilan bog'liq dastrda xatolikka sabab bo'ladigan muammolarni morfotaktik qoidalar asosida yechish yo'llari isbotlangan.

Tadqiqotning amaliy natijasi quyidagilardan iborat:

tadqiqot natijalari o'zbek tili korpuslarining morfologik analizatorlarini takomillashtirish uchun muhim manba ekanligi aniqlangan;

disertatsiyada o'zbek tilida zamonni ifodalovchi

lingvistik ta'minot ehtiyoji bilan tizimlashtirilganligi shu sohaga oid yaratiladigan darslik va qo'llanmalar uchun muhim ma'lumot vazifasini bajarishi asoslab berilgan;

korpuslarni tuzishda foydalanish uchun har bir zamon shakllarining matn tarkibida qo'llanilishlarga oid modellar ishlab chiqilgan.

Tadqiqot natijalarining ishonchligi o'rganilgan materiallarning o'zbek tili tabiatidan kelib chiqqan holda xulosalar qilishga yordam berganligi, ularning asosli ekanligi, metodologik mukammalligi, o'zbek tili korpusi uchun zamonni ifodalovchi grammatik shakllarni annotatsiyalashda amalda ishlatilgan manbalarga tayinlanganligi bilan izohlanadi.

Tadqiqot natijalarining ilmiy va amaliy ahamiyati. Disertatsiya natijalarining ilmiy ahamiyati kompyuter lingvistikasi fanida yangi tadqiqotlar yaratishda nazariy ahamiyat kash etishi, o'zbek tili formalashtirish, kompyuter tili yaratish bo'yicha ilmiy qarashlar orqali boyishi bilan belgilanadi.

Tadqiqotning amaliy ahamiyati undagi materiallar, natija va xulosalar o'zbek tilshunosligida korpus lingvistikasi fanida, bakalavriat va magistratura ta'limi yo'nalishlarida maxsus kurs, maxsus seminarlar o'tishda manba va material vazifasini bajarishi, shuningdek, so'zlarni morfologik tuzish bo'yicha tadqiqotlar olib borishda asos bo'lib xizmat qilishida ko'rinadi.

Tadqiqot natijalarining joriy qilinishi. Zamon shakllarini annotatsiyalash jarayonida yuzaga keladigan grammatik shakllarning omimligi va ko'p ma'noiligi

bilan bog'liq dastrda xatolikka sabab bo'ladigan muammolarni morfotaktik qoidalar asosida yechish yo'llari, davomli zamon qo'shimchalarini qabul qilishda fe'l leksik ma'nosining ta'siri haqidagi xulosalardan Alisher Navoiy nomidagi Toshkent davlat o'zbek tili va adabiyoti universitetida 2020–2022-yillarda bajarilgan AM-FZ-201908172 raqamli "O'zbek tilining ta'limiy korpusini yaratish" nomli amaliy grant loyihasida foydalanilgan (Alisher Navoiy nomidagi Toshkent davlat o'zbek tili va adabiyoti universitetining 2022-yil 24-noyabrdaqi 01-3230-sonli ma'lumotnomasi). Natijada korpus matnidagi zamon shakllarini annotatsiyalash uchun lingvistik ta'minot ishlab chiqilgan.

O'zbek tilida zamon ifodalovchi grammatik shakllarning boshqalaridan farqlanuvchi bevosita kuzatganlik yoki bilvosita xabar topganlik, statik yoki dinamik harakat-holatlar uchun xoslanganlik, subyektni tavsiflash, nutq momentiga bilvosita bog'lanish kabi xususiyatlariga dair xulosalardan Alisher Navoiy nomidagi Toshkent davlat o'zbek tili va adabiyoti universitetida 2021–2023-yillarda bajarilgan FZ-202004165 raqamli "Umumiy o'rta ta'limning boshlang'ich sinf o'quvchilarida og'zaki va yozma nutq kompetensiyalarini rivojlantiruvchi elektron platforma yaratish" mavzusidagi amaliy grant loyihasida foydalanilgan (Alisher Navoiy nomidagi Toshkent davlat o'zbek tili va adabiyoti universitetining 2022-yil 24-noyabrdaqi 01-3229-sonli ma'lumotnomasi). Natijada platforma zamon shakllarining turli nutqiy vaziyatlarda qo'llanilishiga oid ma'lumotlar bilan ta'minlangan.

Zamon shakllarining nuqtda faollik darajasi har xilining og'zaki yoki yozma nuqtda uchrashi, badiiy uslub uchun xoslanganligi, tarixiylashayotganligi haqidagi ilmiy ma'lumotlardan O'zbekiston Milliy teleradiokompaniyasi "O'zbekiston" teleradiokanali "O'zbekiston" radiosi orqali e'ftra uzatilgan radiomuloqotning 21-oktabr – O'zbek tili bo'yami kamiga bag'ishlangan seminar tuzilishida foydalanilgan (O'zbekiston Milliy teleradiokompaniyasi "O'zbekiston" teleradiokanalining 2022-yil 15-noyabrdaqi 04-32-1127-sonli ma'lumotnomasi). Natijada ushbu eshitirish mazmuni ilmiy dalillar bilan boyitilgan.

Tadqiqot natijalarining aprobeatsiyasi. Ushbu tadqiqot natijalari yuzasidan 3 ta xalqaro va 6 ta respublika ilmiy-amaliy konferensiyasida ma'ruza qilingan.

Tadqiqot natijalarining e'lon qilinganligi. Disertatsiya mavzusi bo'yicha joni 16 ta ilmiy ish nashr etilgan, shulardan O'zbekiston Respublikasi Oliy attestatsiya komissiyasining dissertatsiya asosiy ilmiy natijalarini chop etish tavsiya etilgan ilmiy nashrlarda 7 ta maqola, jumladan, 3 tasi xalqaro, 4 tasi respublika jurnallarida nashr qilingan.

Disertatsiyaning tuzilishi va hajmi. Disertatsiya kirish, uch bob, xulosa, foydalanilgan adabiyotlar ro'yxati va ilovadan iborat. Disertatsiyaning umumiy hajmi 159 sahifani tashkil etadi.

DISSERTATSIYANING ASOSIY MAZMUNI

Kirish qismida tamlangan mavzuning dolzarbligi va zarurati asoslab berilgan, muammoni o'rganilganlik darajasi, tadqiqotning maqsad va vazifalari, obyekt va predmeti, fan va texnologiyalar taraqqiyotining ustuvor yo'nalishlariga mosligi ko'rsatilgan, ilmiy yangiligi va amaliy natijalari bayon qilingan. Olingan natijalarning

ishonchilligi asoslangan holda nazariy va amaliy ahamiyati ochib berilgan. Tadqiqot natijalarining amaliyotga joriy etilishi, ishning aprobativiyasi, e'lon qilingan ishlar va dissertatsiyaning tuzatishi bo'yicha ma'lumotlar keltirilgan.

Dissertatsiyaning birinchi bobini "**Zamon kategoriyasining nazariy va metodologik asoslari**" deb nomlangan. Bobning "Jahon tilshunosligida zamon kategoriyasining talqini" deb atalgan 1.1. faslida qadimgi davrdan o'rganilishi bezlangan zamonning tilshunoslikda turli davrlarda shakllangan maktablarning yo'nalish va nuqsadlaridan kelib chiqqan holda tadqiq etilganligi, zamonning umumiy modellari xususida ma'lumotlar berilgan. Jahon tilshunosligidagi ko'plab tadqiqotlarda zamonning vaqtli tilida voqelantirishga xizmat qiluvchi grammatik, leksik, sintaktik vositalar bir butunligi — yaxlit temporal kategoriya sifatida o'rganilishi an'anaga aylangan. H. Reichenbach ikki mara zamon chizig'ida uch nuqta mavjudligi, bu nuqtalarning joylashuv ketma-ketligiga ko'ra turli zamon ma'nolari ifodalantirishni tushuntirib berdi¹⁶. U o'ziga cha bo'lgan grammatikaga oid manbalardagi bir-biriga yaqin zamonlar (masalan, Simple past (Oddiy o'tgan zamon) va Present perfect (Tugallangan hozirgi zamon) ma'nosini tushuntirishdagi muammolarni ayuan mana shu nuqtaning uch nuqtasini farqlamaslik natijasi, deb biladi. Olim uch nuqta sifatida quyidagilarni ko'rsatadi:

1. Nuqta nuqtasi (Point of speech - S).
2. Voqea-bodisa nuqtasi (Point of event - E).
3. Ishora nuqtasi (Point of reference - R).

Oltay tillaridagi fe'l zamonlarini maxsus o'rganagan I. Kormushin tizimida mutlaq va nisbiy zamonlarni ajratadi. Olimning fikricha, o'tgan, hozirgi, kelasi zamonlar mutlaq zamonlar bo'lib, ularning bir-biri bilan munosabatidan nisbiy zamonlar kelib chiqadi. Jumladan, mutlaq o'tgan zamondan uch nisbiy zamon hosil bo'ladi: o'tgan zamonga nisbatan o'tgan zamon, o'tgan zamonga nisbatan hozirgi zamon, o'tgan zamonga nisbatan kelasi zamon. Xuddi shu tartibda hozirgi va kelasi mutlaq zamondan ham uchta nisbiy zamon hosil bo'ladi. Shunday qilib, olim oltay tillari uchun uch mutlaq va to'qqizta nisbiy — jami o'n ikkita zamondan iborat tizimni tavsiya etadi¹⁷. Bizningcha, I. Kormushinning mazkur yondashuvi garchi tizimlilikka asoslanmagan, barcha oltay tillari uchun to'liq tatbiq etib bo'lmaganligi bois keng ommalashmagan.

Grammatik zamoni turli sathlar hamkorligida o'rganish uning mohiyatini yanada aniqroq ochilishiga sabab bo'lgan. O'z navbatida, ko'pchilik tadqiqotchilar foronidan bu temporal maydonda fe'lning grammatik zamon shakllari markaziy o'rinni egallashi ta'kidlangan. Bugungi kunda mazkur kategoriyani tilshunoslikning hankor sohalarini psixolingvistik, neyroolingvistika, korpus lingvistikasi, lingvokulturologiya kabi fanlar nuqtayi nazaridan o'rganishga katta ahamiyat berilmoqda.

Birinchi bobning 1.2. fasli "**Korpus lingvistikasida zamoni annotatsiyalash masalasi**" deb nomlangan. Bu faslda jahon va o'zbek korpus lingvistikasida zamoni shakllarini annotatsiyalash, ularning modellari yaratish yuzasidan amalga oshirilgan

ishlar va bu beradagi muammolar tahlil qilingan. Jahonda zamon kategoriyasini modellashirish formal grammatikani yaratish ehtiyoji bilan bog'liq bo'lib, bu masala kompyuter lingvistikasining mashina tarjimasini, matnning avtomatik tahlili kabi amaliy yo'nalishlari uchun ham muhim ahamiyatga ega edi. Keyinchalik katta hajmli til korpuslarining yuzaga kelishi matnlaridagi axborotlarning zamon bilan bog'liq xususiyatlarini avtomatik tahlil qilish texnologiyalarining ham takomillashuviga olib keldi. Matn tarkibidagi vaqt ma'noli birliklarni aniqlash va ularni annotatsiyasida TIMEX, TIMEX 2, TIDE, TIMEX 2, STAG (Sheffield Temporal Annotation Guidelines) kabi tegrash asmalaridan foydalanilgan bo'lsa, keyinchalik Jeyms Pastojovskiy tomonidan ularning integratsiyasi natijasida fe'l zamonlarini aniqlovchi, shuningdek, bir nechta harakat va holatlar o'rtasidagi zamonga oid munosabatlarni izohlay oluvchi TimeML, ISO-Time ML sxemalari tashlab chiqildi.

Buyuk Britaniyada G. Marsik tomonidan zamon ma'nosini anglatuvchi so'zlar, fe'l zamonlari, harakat-holatlarning zamon bilan aloqador munosabatlari, umuman, matnning zamon bilan bog'liq xususiyatlarini avtomatik annotatsiyalash masalasi monografik tarzda o'rganilgan¹⁸. Ushbu tadqiqot tabiiy tilga avtomatik ishlov berish yo'nalishida bo'lib, ingliz tili matnlarini misolida zamon kategoriyasining kompleks tahlili amalga oshirilgan. Matnning obyektiv vaqt bilan bog'liq xususiyatlarini o'rganishda nafaqat fe'l zamonlari, balki fe'llarning leksik va morfologik aspektlari, payt ehlari va ravishlari, vaqt ma'noli bog'lovchilarning ahamiyati ko'rsatib berilgan.

Turkiy tillar morfologiyasining avtomatik tahliliga bag'ishlangan ishlardan analiz jaroyatini grammatik lug'at, so'zshakl modeli va morfologik qoidalarga asoslanishi haqida xulosa chiqarish mumkin. Morfsintaktik qoidalar doirasida qo'shimchaning asosga biriktirishdagi muayyan qoidalar, shuningdek, asos xususiyatidan kelib chiqib allomorflardan mosirning tanlanishi (masalan, -gan o'tgan zamon shaklining k udoshti bilan tugagan asoslarga -kan, q undoshi bilan tugagan asoslarga -qan tarzida qo'shilishi) nazarda tutiladi. Shuningdek, turkiy tillarning avtomatik morfologik tahlil tizimlari uchun FST (Finite state transducer) kompyuter modelidan keng foydalaniladi.

O'zbek korpus lingvistikasida ham zamon shakllarini annotatsiyalash yuzasidan filchlar morfologik tegrash, morfomalizator ishlab chiqish masalalari doirasidagi tadqiqotlarda biddirilgan. Sh. Hamroyeva "O'zbek tili morfologik analizatorning lingvistik to'lmavi" mavzusidagi dissertatsiyasida o'zbek tili morfomalizatori uchun grammatik kategoriyalarni o'zbek tili qonuniyatlarini asosida qat'iy belgilash lozimligini ta'kidlab, o'zbek tilidagi 11 ta grammatik kategoriyani, jumladan, zamon kategoriyasini ham ko'rsatib o'tadi¹⁹. Dissertatsiyada morfologik razmetka, morfomalizatorlarning lingvistik ta'minoti yuzasidan ma'lumotlar keltirilib, bu yo'nalishdagi tadqiqotlarning umumiy tamoyillari belgilab beriladi.

S. Muhamedova harakat fe'llari va ularning valentlik imkoniyatlari asosida kompyuter dasturlari uchun lingvistik ta'min yaratish usulida ish olib borgan. Ishda

¹⁶ M. Reichenbach, *Elementary Principles of Syntactic Logic* (The Elements of Syntax) — New York: The Macmillan Company, 1947, p. 237-238.

¹⁷ Kormushin I. *Corpus lingvistikasida zamoni annotatsiyalash* — M.: Hayat, 1984 — C. 6-7.

¹⁸ Marsik G. *Temporal processing of news: annotation of temporal expressions, verbal events and temporal relations. A theory submitted to partial fulfillment of the requirements of the University of Wolverhampton for the degree Doctor of Philosophy* — Wolverhampton, 2011 — 349 p.

¹⁹ Hamroyeva Sh. *O'zbek tili morfologik kategoriyalari* — Tashkent: Fan va adabiyot, 2001 — E. 156.

fe'llarning grammatik shakllari qabul qilishiga ulardagi lug'aviy ma'noning ta'siri ham ko'rsatib o'tilgan²².

M.Ajabalova o'zbek tili matnlarining avtomatik tahlili va tahriri bo'yicha amalda oshirgan tadqiqotida tahlilning morfologik bosqichi doirasida zamon shakllariga ham to'xtaladi²³. Olima o'lgan zamon uchun 13 ta, hozirgi zamon uchun 6 ta, kelasi zamon uchun 9 ta shaklni ajratib ko'rsatadi. Sh.Hamroyeva, O'Xoljiyov, G.Abdullimovalar tamonidan tuzilgan "Fe'l shakllari lug'at"da zamoning o'zida 49 ta, variantlari bilan esa 66 ta shakl mavjudligi qayd etiladi²⁴.

N.Abdurasmonovning "O'zbek tili elektron korpusining kompyuter modelirlari" nomli monografiyasida qoidaga asoslangan, ehtimolga asoslangan va gibrid asosli teglash usullari haqida ma'lumot berilib²⁵, O'zbek tili korpusi (uzbekcorpus.uz)ga asoslangan holda fe'lga xos 26985 ta kombinatsiya hosil qilinishi haqida ma'lumot beriladi.

Bobning 1.3. fasil "O'zbek tilidagi zamon shakllarining tasniflashi" deb nomlangan. O'zbek tilidagi zamon shakllarining grammatik shakllari va ularning tasnifi eng muvazirali masalalardan biri bo'lib kelgan. Formal-ovsifiy metod asosida amalga oshirilgan ishlarda zamonni anglatuvchi grammatik shakllar aniqlandi va ularning har xil natijalar qo'llanishidagi ma'nolari izohlandi. Tishunov A.Hojiyev zamonni ifodalovchi grammatik shakllarning to'yxat va ularning tasnifidagi turli-tamanlikka e'tibor qaratadi: "Turli darajali va qo'llanmalar, ayrim monografiyalari, shuningdek, qiyosiy planidagi ishlardan tashqari o'zbek tilidagi fe'l zamonlari temasi bo'yicha to'rtta kandidatek dissertatsiyasi yoqilandi. Biroq har bir zamon formasining o'ziga xos xususiyati haqidagina emas, hatto hozirgi o'zbek adabiy tilida fe'lning qaysi zamon qanday formalarga ega ekanligi haqida ham shu vaqtga qadar bir xil fikrga kelinagan emas"²⁶. Tishunov o'zining mazkur mulohazalari bugun ham o'z kuchida turibdi. Masalan, A.Sulaymonov "Fe'l zamonlari" kitobida o'lgan zamon hosil qiluvchi 24 ta invariant simetrik va analitik shaklni ko'rsatgan²⁷. A.Hojiyev "O'zbek tili grammatikasi" (1975) da 10 ta shunday shaklni qayd etadi²⁸. A.G'ulomovning "Fe'l" risolasida o'lgan zamon shakllari sari 7 ta²⁹, 1966-yilda chop etilgan "Hozirgi o'zbek adabiy tili (Morfologiya)" darsligida esa ularning sari 12 tani tashkil etadi³⁰. Boshqa zamon shakllari inqidorida ham shunday bir xilliklar kuzatiladi. Bizningcha, buning asosiy sabablaridan biri o'zbek tilida zamon va mayl kategoriyalarining chambarchas bog'liqligida va grammatik shakllarning ham zamon, ham mayl ma'nosini ifodalashida ko'rinadi. Sistem-struktur yondashuvda esa zamon shakllaridagi isoniy va natqiy jihatlari farqlandi, turli natqiy ma'nolar

²² M.Yunusov, "Xarakteristik shakllar asosida zamonlar tuzilishini aniqlashga yozilgan muvazirlik", *Yozma*, 2006, № 1, s. 40-41.

²³ Ajabalova M., *Yozma*, 2006, № 1, s. 40-41.

²⁴ "Hozirgi o'zbek adabiy tili (Morfologiya)", *Yozma*, 2006, № 1, s. 40-41.

²⁵ Abdurasmonov N., *Yozma*, 2006, № 1, s. 40-41.

²⁶ Abdurasmonov N., *Yozma*, 2006, № 1, s. 40-41.

²⁷ Abdurasmonov N., *Yozma*, 2006, № 1, s. 40-41.

²⁸ Abdurasmonov N., *Yozma*, 2006, № 1, s. 40-41.

²⁹ Abdurasmonov N., *Yozma*, 2006, № 1, s. 40-41.

³⁰ Abdurasmonov N., *Yozma*, 2006, № 1, s. 40-41.

amallashirildi. Xususan, O'Zikrillayev³¹, B.Mengliyev³², Sh.Shahobiddinova³³, N.Musulmonova³⁴ kabi olimlarning ishlari zamon shakllarining umumiy ma'nosini ochish va natqiy qo'llanishlarida bu umumiy ma'noning ma'lum bir qirralarining xususiy ma'no sifatida voqetlanishi masalalarini tahlilga tortildi.

Bizningcha, natq momenti (N), ishora vaqt (I), harakat-holat vaqti (H)ning munosabatidan kelib chiqib zamon shakllarining tasnifi quyidagicha amalga oshirish mumkin:

I. O'lgan zamon shakllari:

1.1. N>I-H strukturasi ifodalaydigan o'lgan zamon shakllari: -di, -b (-bb), edi.

1.2. N>I>H strukturasi ifodalaydigan o'lgan zamon shakllari: -gan (-kan, -qan)

1.3. N>I>H strukturasi ifodalovchi o'lgan zamon shakllari: -gan edi (-kan edi, -qan edi), -b edi (-bb edi).

1.4. N>I<H strukturasi ifodalaydigan davomli o'lgan zamon shakllari: -r edi (-ar edi), -yugan edi (-ayotgan edi), -yotib edi (-ayotib edi), -yotir edi (-ayotir edi), -moqta edi.

II. Hozirgi zamon shakllari:

II.1. N=I-H strukturasi ifodalovchi umumiy hozirgi zamon shakllari: -a (-y), -yotib (-ayotib), -yotir (-ayotir), -moqda, -yotgan. Shuningdek, *yurmoq, turmoq, o'tirmoq, yotmoq* fe'llarining ko'makchi fe'l va holat fe'li sifatida hozirgi zamon ma'nosida qo'llanilishi.

II.2. N=I<H strukturasi ifodalovchi davomli hozirgi zamon shakllari: -yap, -yotib (-ayotib), -yotir (-ayotir), -moqda, -yotgan. Shuningdek, *yurmoq, turmoq, o'tirmoq, yotmoq* fe'llarining ko'makchi fe'l va holat fe'li sifatida hozirgi zamon ma'nosida qo'llanilishi.

III. Kelasi zamon shakllari:

III.1. N<I=H strukturasi ifodalovchi kelasi zamon shakllari: -a (-y), -r (-ar), -yugan (-ayotgan), -ajak (-ayotak), -gay (-kay, -qay)

Shuningdek, kelasi zamonda ham natija va davomiylik ma'nolari ifodalaniishi mumkin. Bu ma'nolar -gan/-kan/-qan, -ayotgan shakllari va bo'l fe'li yordamida yuzaga keltiriladi. Bunda natija ma'nosi uchun -gan/-kan/-qan shaklidan so'ng kelgan bo'l fe'lga kelasi zamoni ifodalovchi -a, -ar shakllari qo'llaniladi. Kelasi zamondagi natija ma'nosini N<I=H strukturasi orqali ifodalash mumkin. Kelasi zamondagi davomiylik ma'nosi uchun esa -ayotgan shaklidan so'ng kelgan bo'l fe'lga kelasi zamoning -a, -ar shakllari qo'llaniladi. Harakat-holatning natq momentidan keyin boshlab, ishora vaqtida davom etib turganligi ma'nosi anglatiladi. Bunda zamon N<I<H strukturasi ega bo'ladi.

"Zamonni annotatsiyalash darajalari" deb nomlangan ikkinchi bobning 2.1 fasil "Zamonni annotatsiyalashning grammatik darajasi" deb ataladi. Zamonni ifodalovchi grammatik shakllar gapping natq momentiga munosabati belgilashda birilmechi va eng muhim vosita hisoblanadi. Zamon shakllarning o'zbek

³¹ Zikrillayev O., *Yozma*, 1995, № 1, s. 40-41.

³² Mengliyev B., *Yozma*, 1995, № 1, s. 40-41.

³³ Shahobiddinova S., *Yozma*, 1995, № 1, s. 40-41.

³⁴ Musulmonova N., *Yozma*, 1995, № 1, s. 40-41.

³⁵ Abdurasmonov N., *Yozma*, 2006, № 1, s. 40-41.

³⁶ Abdurasmonov N., *Yozma*, 2006, № 1, s. 40-41.

³⁷ Abdurasmonov N., *Yozma*, 2006, № 1, s. 40-41.

³⁸ Abdurasmonov N., *Yozma*, 2006, № 1, s. 40-41.

³⁹ Abdurasmonov N., *Yozma*, 2006, № 1, s. 40-41.

tilshunosligida amalga oshirilgan ta'riflarini umumlashtirgan holda 2-, 3- va 4-jadvallarda keltirilgan birliklarni zamon grammatik shakllari sifatida qabul qildik. Quyidagi etish joizki, keltirilgan zamonni ifodalovchi shakllarning tilda faollik darajasi har xil. Ayrin shakllar juda keng iste'molda bo'lgani holda, ba'zi shakllar faqat muayyan bir uslub, janr doirasidagina qo'llaniladi. Bu jarayonlarni kuzatishda va xolis baholashda til korpuslarining ahamiyati juda katta. Internet tarmoq'iga joylangan, bugun amalda foydalanilayotgan ba'zi til korpuslari matnlarida zamon shakllarning qo'llanilish ehtimosini tahlil qildik. Tahlillarimizda, asosan, hozirgi kunda tishanun ko'proq so'z bazasiga ega bo'lgan O'zbek tilining ta'limiy korpusi (uzschoolcorpora.uz) matnlariga tayandik. Natijalar mazkur korpus matnlarida o'tgan zamon shakllari 4363937 marta (56%), hozirgi zamon shakllari 2854941 marta (36%), kelasi zamon shakllari 613617 marta (8%) uchrasini ko'rsatdi.

Bobning 2.2. faoli "Zamonni annotatsiyalashning semantik darajasi" deb nomlanib, unda zamonni ifodalovchi grammatik shakllarni qabul qilishda va zamon ma'nosini ifodalashda fe'l leksik ma'nosining ta'siri tahlil qilinadi. Jahon tilshunosligida bu masala fe'larni aspektual guruhlariga ajratish orqali hal qilinadi. O'zbek tilshunosligida fe'l zamonlari yuzasidan olib borilgan tadqiqotlarda bu masalaga alohida e'tibor qaratilmagan. Faqat hozirgi zamon doirasida *yo'lmoch*, *yurmoq*, *turmoq*, *o'tirmoq* fe'llarning -ib shakli bilan o'ziga xos tarzda mazmunan hozirgi zamonni ifodalashi masalasiga gina to'xtalangan. Biz leksik ma'nosiga ko'ra zamon shakllarini qabul qilishda o'ziga xos xususiyatga ega bo'lgan fe'llarni quyidagi ma'noviy guruhlarga ajratdik:

1. Bir lahzaalik harakat-holatning oxirgi natijasini ifodalovchi fe'llar: *topmoq*, *yo'qotmoq*, *pasqonmoq*, *qo'qilmoq* (o'zbek misolida), *chertmoq*, *uzg'otmoq*, *tanimoq*, *chalgatmoq*, *sinamoq* kabi.
2. Davomiylikni ifodalovchi holat fe'llari: *yurmoq*, *turmoq*, *yo'lmoch*, *o'tirmoq*, *ishlamoq*, *nafratlanmoq* kabi fe'llar.
3. Statik holat mazmunini ifodalovchi fe'llar: *sevinmoq*, *bilmoq*, *xursand bo'lmoq*, *ishlamoq*, *nafratlanmoq* kabi fe'llar.
4. Jismoniy harakatlarni ifodalovchi fe'llar: *boramoq*, *ketmoq*, *yurmoq*, *chopmoq*, *qaytmoq* kabi fe'llar.

Bir lahzaalik harakat-holatlarni ifodalovchi fe'llar davomiylik mazmuniga ega bo'lmaydi. Ular zamon o'qida muayyan bir nuqtani ko'rsatuvchi, qisqa lahzaalik harakat-holatlarni ifodalaydi va davomli zamon shakllari bilan qo'llanmaydi. Biroq ko'p ma'noli fe'llar bir ma'nosi bilan davomli zamon shaklini qabul qilmagani holda boshqa ma'nosi bilan bu shakllarni olavertishi mumkin. Masalan, *topmoq* fe'li "O'zbek tilining izohli lug'atidagi" 1) Yo'qotgan, umuman, qidirilayotgan (qidiruvda bo'lgan) narsa yoki shaxsni duch keltirmoq, ko'zga ilintirmoq, uchratmoq, 2) Nugahton ko'zi tushib qo'lga kiritmoq, topib olish¹⁰, ma'nolari bilan davomli zamonida ishlatilmaydi. Lekin lug'atdagi "3 Qidirish, kuzatish, izlanish batijasida kashf etmoq, ochmoq, 4 Noma'lum bo'lgan narsani aniqlamoq, nima ekanini belgilamoq, taxmin etmoq, 5 Umuman, ish-mehnat, biror sabab va-sh.k. bilan ega bo'lmoq, erishmoq"¹¹ ma'nolari bilan davomli zamon shakllarini qabul qilavermi.

Jumladan, Ta'limiy korpusdagi matnlarida *topmoq* fe'li hozirgi davomli zamon shakllari bilan 839 o'rinda uchraydi va ularning barchasida izohli lug'atdagi 3-, 4-, 5- ma'nolari bilan birin ifodalangan. Masalan: *Ilmniy tarqoqlar orqali hokimlik va boshqaruv idoralari qo'llanilayotgan ma'ruzalarda o'z yechimini topmoqmi? O'quv-senayirida shu kabi masalalar muhokamalar markazida bo'ldi.* (85 uz.). Alohida qayd etish joizki, bu turdagi fe'llar bo'lishsizlik shaklida qo'llanganda qisqa lahzaalik harakat ma'nosi yo'qoladi va davomiylikka ega bo'ladi. Shu bois ular bo'lishsizlik shakli bilan hozirgi davomli zamon shakllarini qabul qilishi mumkin. Masalan: *O'zbekistonda ham savodli mutaxassislar juda ko'p. Ularni hech kim puyqatmayapti.* (kin.uz)

turmoq, *yurmoq*, *yo'lmoch*, *o'tirmoq* fe'llarining -ib shakli bilan hozirgi zamonni anglatishi ularning leksik ma'nosini bilan bog'liq bo'lib, ular holat fe'li, ko'makchi fe'li bo'lganda davomiylik ma'nosini ifodalaydi. Harakat ma'nosini bildirganda esa -ib shakli bilan o'tgan zamon ma'nosini anglatadi. Ta'limiy korpus matnlarida mazkur fe'llarning -ib qo'shimchasini olib shaxs-sonda tushlangan holatlaridan anglashiladigan zamon ma'nosini tahlil qildik. Tahlil natijalari quyidagi jadvalda aks etgan¹².

T/r	Fe'l shakli	O'tgan zamon ma'nosida		Hozirgi zamon ma'nosida	
		Soni	Foizi	Soni	Foizi
1	yur+ib+shaxs-son	34	2%	1509	98%
2	tur+ib+shaxs-son	45	0,2%	24183	99,8%
3	o'tir+ib+shaxs-son	4	0,5%	849	99,5%
4	yot+ib+shaxs-son	12	0,8%	1427	99,2%
	Jami	95	0,3%	27968	99,7%

Jadvaldan ko'rinadiki, keltirilgan fe'l shakllari bugungi kunda o'tgan zamon ma'nosida juda kam ishlatiladi.

Ikkinchi bobning 2.3. fasli "Zamonni annotatsiyalashning kontekstual darajasi" deb nomlangan. O'zbek tilshunosligida zamon shakllarning qo'llanilishida kontekstning ahamiyati zamonlarning ko'chishi, zamonlarning ustubiy xususiyatlari kabi mavzular ostida qisman o'rganilgan. Bu borada A.G'ulomov, A.Hojiyev, Sh.Shukurov, M.Sodiqova, J.Abdullajonova kabilarining izlanishlari muhim ahamiyatga ega. Zamonlarning ko'chishida grammatik shakl kontekst ta'sirida uzul ma'nosiga ko'ra mansub bo'lgan tasnifdan tashqariga oqibishi va boshqa bir zamon ma'nosini ifodalashi e'tiborga olinadi. Masalan, -di shakli kontekst ta'sirida nutq momentiga eng yaqin nuqtadagi kelasi zamonidagi harakat-holatlarni ham ifoda etishi mumkin. Nutqimizda tez-tez uchraydigan "Bo'pti, men ketdim" tarzidagi gapda qo'llangan *ketdim* so'zida ketish harakati nutq momentidan keyin yuz beradi va tahlilda uni kelasi zamonidagi fe'l sifatida ko'rsatish to'g'ri bo'ladi. Misoldagi *ketdim*

¹⁰ S. Guliyeva, 2012-yilning 1-iyulidagi 12-krizisga bo'lgan ehtiyoj oshirgani
¹¹ T. Nigmatov A. Qo'qil - To'qimov - Qo'qil, 1954 - b. 33, Xonitov A. Qo'qil - To'qimov, 1971 - b. 118, Ilyayeva U. 300ga yuzasidan qisqa mahalliylikni muhokama - To'qimov, 1976, - b. 160 G. Guliyeva M. Qisqa mahalliylik - To'qimov, 1975, - b. 21-29, Abdullajonova J. Qisqa mahalliylikni muhokama - To'qimov, 1975, - b. 101-102.

¹² S. Guliyeva, 2012-yilning 1-iyulidagi 12-krizisga bo'lgan ehtiyoj oshirgani
¹³ Ko'rsatilmagan lug'at - b. 146-149.

so'zshaklining aynan kelasi zamonning \rightarrow qo'shimchasi bilan ifodalangan *kelasiga* nisbatan ma'noviy farqlanishi ham mavjud bo'lib, *kelasim* kelasi zamonida y'uz beradigan harakatning muq momentiga eng yaqin ekanligini ifodalaydi.

Disseratsiyaning uchinchi bobi "**O'zbek tilidagi zamon shakllari annotatsiyasi**" deb nomlangan. Uning 3.1. fasli "Zamon shakllari annotatsiyasida morfotaktik qoidalar" deb ataladi. Zamon shakllarini annotatsiyalash jarayonida ularning asosga, o'zidan oldingi va o'zidan keyingi qo'shimchaga birlashish imkoniyatlari – morfotaktik qoidalar alohida ahamiyat kash etadi. Ayniqsa, ommonim va polissemantik grammatik shakllarning ma'nosini so'zning pozitsiyasi hisobiga avtomatik farqlash ko'p hollarda morfotaktik qoidalar asosida amalga oshiriladi. Zamoni ifodalovchi grammatik shakllarning fe'l kesim tarkibida joylashuvi quyidagi umumiy model asosida belgilanadi:

Fe'l tomma + nisbat shakli + [bo'lishsizlik shakli] \rightarrow zamon shakli + [shaxs-son shakli] + yuklama.

Modeldagi til birliklarini o'zbekcha nomiga aloqador holda bo'yo'natishdagi oldingi ishlarda⁸ berilgan sharti belgilar bilan ifodaladik, ya'ni fe'l lemmani "F", nisbat shaklini "N", bo'lishi/bo'lishsizlik shaklini "BB", zamon shaklini "Z", shaxs-son shaklini "Sh" bilan belgiladik. Modellar tarkibida ayrim qismlarning qatnashishi qat'iy qoida bo'lsa, ayrim qismlarning tushib qolish ehtimoli bor. Modellar so'zining ko'payib ketishini oldini olish maqsadida tushib qolish ehtimoli mavjud bo'lgan grammatik shakllarni ifodalaydigan belgi oldidan 1 ishorasi qo'yildi. Annotatsiyasida zamon shakli haqidagi ma'lumot qisqartirilgan sharti belgilarda ifodalandi. O'zbek korpus lingvistikasidagi ma'lumotlarda o'lgan zamon ma'nosini uchun "Z1", hozirgi zamon uchun "Z2", kelasi zamon uchun "Z3" belgilaridan foydalanib kelinadi. Zamon uzumiga kiruvchi har bir shakl va uning allomorflari, shuningdek, variantlari ham alohida-alohida sharti belgisiga ega bo'lishi lozim. Grammatik shaklning allomorflari "al" qisqartmasi bilan, qo'shib yoki ajratilib yoziladigan variantlari "var" qisqartmasi bilan berildi. Qavs ichida keltirilgan dastlabki raqam o'lgan zamon grammatik shaklning tartib raqamini, "al" qisqartmasidan keyingi raqam allomorflarning raqamini, "var" qisqartmasidan keyingi raqam esa grammatik shakl variantining raqamini ifodalaydi.

"O'lgan zamon shakllari annotatsiyasi" deb nomlangan 3.2. faslda o'lgan zamonning har bir grammatik shakli bir-biridan farq qiluvchi belgilar asosida izohlanadi, har bir shakl uchun sharti belgilar birlashtiriladi. O'lgan zamon grammatik shakllarning ko'pligi va ularning manzar tarkibida qo'llanilish chastotasining yuqorligi bilan boshqa zamonlardan ajralib turadi. O'lgan zamoni ifodalovchi grammatik shakllar soni 11 ta bo'lib, allomorflari va variantlari bilan ularning soni 28 taga yetadi (2-jadval).

8. Boshqaruq M.A. Sifatli (zamon) shakllari (shakllari) o'zbekcha nomiga aloqador holda bo'yo'natishdagi oldingi ishlarda berilgan sharti belgilar bilan ifodaladik, ya'ni fe'l lemmani "F", nisbat shaklini "N", bo'lishi/bo'lishsizlik shaklini "BB", zamon shaklini "Z", shaxs-son shaklini "Sh" bilan belgiladik. Modellar tarkibida ayrim qismlarning qatnashishi qat'iy qoida bo'lsa, ayrim qismlarning tushib qolish ehtimoli bor. Modellar so'zining ko'payib ketishini oldini olish maqsadida tushib qolish ehtimoli mavjud bo'lgan grammatik shakllarni ifodalaydigan belgi oldidan 1 ishorasi qo'yildi. Annotatsiyasida zamon shakli haqidagi ma'lumot qisqartirilgan sharti belgilarda ifodalandi. O'zbek korpus lingvistikasidagi ma'lumotlarda o'lgan zamon ma'nosini uchun "Z1", hozirgi zamon uchun "Z2", kelasi zamon uchun "Z3" belgilaridan foydalanib kelinadi. Zamon uzumiga kiruvchi har bir shakl va uning allomorflari, shuningdek, variantlari ham alohida-alohida sharti belgisiga ega bo'lishi lozim. Grammatik shaklning allomorflari "al" qisqartmasi bilan, qo'shib yoki ajratilib yoziladigan variantlari "var" qisqartmasi bilan berildi. Qavs ichida keltirilgan dastlabki raqam o'lgan zamon grammatik shaklning tartib raqamini, "al" qisqartmasidan keyingi raqam allomorflarning raqamini, "var" qisqartmasidan keyingi raqam esa grammatik shakl variantining raqamini ifodalaydi.

I.	O'lgan zamon shakllari	Sharti belgisi
I.1	-di	Z1(1)
I.2.1	-b	Z1(2.al1)
I.2.2	-ib	Z1(2.al2)
I.3.1	-gan	Z1(3.al1)
I.3.2	-kan	Z1(3.al2)
I.3.3	-qan	Z1(3.al3)
I.4	edi	Z1(4)
I.5.1.1	-gan edi	Z1(5.al1.var1)
I.5.1.2	-gandi	Z1(5.al1.var2)
I.5.2.1	-kan edi	Z1(5.al2.var1)
I.5.2.2	-kandi	Z1(5.al2.var2)
I.5.3.1	-qan edi	Z1(5.al3.var1)
I.5.3.2	-qandi	Z1(5.al3.var2)
I.6.1	-b edi	Z1(6.al1)
I.6.2	-ib edi	Z1(6.al2)
I.7.1.1	-r edi	Z1(7.al1.var1)
I.7.1.2	-rdi	Z1(7.al1.var2)
I.7.2.1	-ar edi	Z1(7.al2.var1)
I.7.2.2	-ardi	Z1(7.al2.var2)
I.8.1.1	-yotgan edi	Z1(8.al1.var1)
I.8.1.2	-yotgandi	Z1(8.al1.var2)
I.8.2.1	-ayotgan edi	Z1(8.al2.var1)
I.8.2.2	-ayotgandi	Z1(8.al2.var2)
I.9.1	-yotib edi	Z1(9.al1)
I.9.2	-ayotib edi	Z1(9.al2)
I.10.1	-yotir edi	Z1(10.al1)
I.10.2	-ayotir edi	Z1(10.al2)
I.11	-moqda edi	Z1(11)

O'lgan zamon shakllari doirasida 50 ta model ishlab chiqildi. Masalan, -di shakli uchun quyidagicha izoh, modellar shakllantirildi:

-di shakli. O'lgan zamonning ushbu shakli qo'llanilish chastotasiga ko'ra eng faol bo'lib, muq momentidan oldin yuz bergan, so'zbochi tomondan bevosita kuzatilgan harakat-holatlar ifodasi uchun qo'llanadi. Ushbu shakl orqali hozirgi va kelasi zamon ma'rolari ham ifodalaniishi uning polissemantik xususiyatiga ega ekanligini ko'rsatadi. Shuningdek, shaxs-son ma'nosini anglanuvchi -di shakli bilan ommonimik munosabatga kirishadi. -di zamon shaklning uchinchi shaxsda ham zamon, ham shaxs-son ma'nosini ifodalab kelish holati hoki, modellashtirishda bunga ham alohida e'tibor qaratish joiz. Bu holatlarning modellar orqali farqlab berilishi avtomatik tahlil sifatini oshiradi uchun xizmat qiladi.

Quyidagi modellar orqali -di zamon shakli va -di shaxs-son qo'shimchasi orasidagi ontomiyani farqlash, shuningdek, uchinchi shaxsda -di zamon shaklning shaxs-son ma'nosini ham anglatish holatini modellashtirish mumkin.

a) agar -di shaklidan so'ng shaxs-son qo'shimchasi kelsa, -di o'lgan zamon shakli bo'ladi, ya'ni:

$$F+ \downarrow N+ \downarrow BB+di+Sh \text{ bo'lsa, "di"}=Z1(1)"; \text{Masalan: } \textit{bordim}$$

b) agar -di shaklidan oldin -(y)h, -a, -y, -(a)yo'tib zamon shakllari kelsa, -di shaxs-son qo'shimchasi bo'ladi, ya'ni:

$$F+ \downarrow N+ \downarrow BB+(1)h/a/y/(a)yo'tib+di \text{ bo'lsa, "di"}=Sh2"; \text{Masalan: } \textit{bo'rtib, yozadi, o'qiydi}$$

d) agar -di shaklidan oldin -(1)h, -a, -y, -(a)yo'tib zamon shakllari kelmasi va undan so'ng grammatik shakl yo'q bo'lsa yoki -lar shakli kelsa, yoki yuklama kelsa, -di zamon va shaxs-son ma'nosini anglatadi, ya'ni:

$$F+ \downarrow N+ \downarrow BB+di+O'lar/yuklama \text{ bo'lsa, "di"}=Z1(1) \text{ va } Sh". \text{Masalan: } \textit{o'qidi, yozsirmadilar, bo'rdim.}$$

-di shaklining kontekst ta'sirida kelasi zamonni anglatish holatlarining ayrimlarini modellashtirish imkoni bor. Model tuzilishidan oldin grammatik shaklning muayyan birlikda tarkibida qo'llanilishiga oid misollar yig'ildi, misollardan anglatilgan zamonlarning ulushi aniqlandi va ularni umumlashtira oladigan qolip ishlab chiqildi. Masalan, Ta'limiy korpus matnlarida -di shakli ravishdosh bilan birga qo'llangan *nima qilidin/nima qiladi* birkimasi tarkibida 97% holatda kelasi zamon ma'nosini anglatadi va uni modellashtirish mumkin:

Agar -(1)h shaklidagi ravishdoshdan so'ng *nima qilidin/nima qiladi* birkimasi kelsa, -di shakli kelasi zamon ma'nosini anglatadi, ya'ni:

$$F+ \downarrow N+(1)h+nima \text{ qil+di+ni/nima qil+di+k bo'lsa, "di"}=Z3"$$

Bobning "Hozirgi va kelasi zamon shakllari annotatsiyasi" deb nomlangan. 3.3 faslida 3-jadvalda keltirilgan hozirgi zamon shakllari uchun 22 ta, 4-jadvalda keltirilgan kelasi zamon grammatik shakllari uchun 15 ta model ishlab chiqildi.

II		Hozirgi zamon shakllari		Shartli belgisi	
II.1.1	-y			Z2(1.a1)	
II.1.2	-a			Z2(1.a2)	
II.2	-yap			Z2(2)	
II.3	-menda			Z2(3)	
II.4.1	-yotib			Z2(4.a1)	
II.4.2	-yo'tib			Z2(4.a2)	
II.5.1	-yotir			Z2(5.a1)	
II.5.2	-yo'tir			Z2(5.a2)	
II.6.1	-yotgan			Z2(6.a1)	
II.6.2	-yo'tgan			Z2(6.a2)	
II.7.1	-yidigan			Z2(7.a1)	
II.7.2	-odigan			Z2(7.a2)	
II.8	yarib			Z2(8)	
II.9	tarib			Z2(9)	
II.10	yo'tib			Z2(10)	
II.11	o'tirib			Z2(11)	

3-jadval

III		Kelasi zamon shakllari		Shartli belgisi	
III.1.1	-y			Z3(1.a1)	
III.1.2	-a			Z3(1.a2)	
III.2.1	-f			Z3(2.a1)	
III.2.2	-ar			Z3(2.a2)	
III.3.1	-ydigan			Z3(3.a1)	
III.3.2	-adigan			Z3(3.a2)	
III.4.1	-yajak			Z3(4.a1)	
III.4.2	-qjak			Z3(4.a2)	
III.5.1	-gay			Z3(5.a1)	
III.5.2	-kav			Z3(5.a2)	
III.5.3	-qsy			Z3(5.a3)	

4-jadval

Hozirgi zamon nutq momentiga to'g'ri kelganligi sababli boshqa zamonlarni belgilashda asos vazifasini bajaradi. Hozirgi zamon grammatik shakllari nafaqat harakatning davomiyligini dinamik xarakterda ifodalaydi, balki umumun statik tarzda nutq momentida amalda bo'lib turgan, subyektlarning doimiy xususiyatlarini bildiruvchi holatlarni ham anglatadi. Quyida hozirgi zamon shakllari orasida ham, kelasi zamon shakllari orasida ham qo'llanilish chastotasi eng yuqori bo'lgan -a/-y shaklning annotatsiyasi haqida to'xtalib o'tuniz. Hozirgi zamonning -a/-y shakli orqali nutq momentida amalda bo'lib turgan, takroriy analigi ostib turgan, statik mavjud bo'lgan, shuningdek, subyektlarning doimiy xususiyatlarini, odaty tartib-qoidalarni bildiruvchi harakat-holatlar ifodalanadi. -a/-y shakli bilan hozirgi zamon ma'nosini (fodabanganda fe'l asosidan ko'proq harakat ma'nosini emas, balki holat va faoliyat ma'nosini anglatiladi).

-a/-y shaklning fe'l tarkibida hozirgi zamon ma'nosini anglatish holatini annotatsiyalashda bu shaklning omonimik va polisemantik xususiyatlarini hisobga olish tabiiydir. -a/-y orqali fe'l so'z turkumi doirasida hozirgi zamon shakli, kelasi zamon shakli, fe'lning lug'aviy tarz shakli, ravishdosh shakli yasalishi mumkin.

-a/-y shaklning ravishdosh yoki hozirgi zamon shakli hosil qilishini, shuningdek, -y shaklning buyruq-istak mavlini hosil qilish holatini farqlashda shaxs-son qo'shimchalari filtr vazifasini bajaradi. Agar -a/-y shaklidan so'ng shaxs-son qo'shimchalari qo'shilsa, u holda -a/-y hozirgi zamon shakli hisoblanadi, aks holda -a/-y ravishdosh yoki -y buyruq-istak mavli shakli bo'ladi.

$$\text{Agar } F+ \downarrow N+ \downarrow BB+ \text{y}+ Sh2 \text{ bo'lsa, u holda "y"}=Z2(1.a1)";$$

$$\text{Agar } F+ \downarrow N+ \downarrow a+ Sh2 \text{ bo'lsa, u holda "a"}=Z2(1.a2)";$$

Ta'limiy korpus matnlarida -a/-y shaklning zamon qo'shimchasi vazifasida qo'llanilishini tahlil qilganimizda, uning ko'proq hozirgi zamon ma'nosini uchun qo'llanilganligini kuzatdik (75%). Kelasi zamon ma'nosini esa asosan gap tarkibidagi bu zamonga ishora qiluvchi maxsus lug'aviy birlıklar ta'sirida ifodalangan (25%). Demak, muqдор jihatdan -a/-y shakli orqali hozirgi zamon ma'nosini ifodalashning ustuvorligini hisobga olib, modellashtirishda -a/-y bilan kelasi zamon ma'nosini (fodalanishini) bu zamonga ishora qiluvchi maxsus kalit so'zlarga bog'lab qo'yish mumkin. M. Hakimova kelasi zamonni ifodalovchi payt ravishlari statusiga eraga.

endi, endilikda, endigina, keyin, keyincha, so'ng, so'ngro, halizamon lektsiyalarini kiritadi¹⁰. Shuningdek, yuqorida tizda, tez orada kabi payt ma'noli lektsiyalar ham a-y shaklining kelasi zamon ma'nosida kelishiga ta'sir o'tkazadi. Ularni umumlashtirib kelasi zamonga ishora qiluvchi birtiklar (KZIQB) ro'yxatini shakllantirish mumkin.

Kelasi zamonga ishora qiluvchi birtiklar (KZIQB)=ertaga/endi/endilikda/endigina/keyin/keyincha/so'ng/so'ngro/halizamon /yuqorida/tez orada/tezda.

KZIQB + F⁻¹ N + 1BB + y + Sh2 bo'lsa, u holda "y=Z3(1.a1)"

KZIQB + F⁻¹ N + a + SH2 bo'lsa, u holda "y=Z3(1.a2)"

Ayrim fe'l asoslariga a-1 zamon shaklining qo'shilishi natijasida boshqa bir fe'l lemma bilan shakldo'shlik yuzaga keladi. "O'zbek tilining izohli lug'ati"¹¹ dagi quyidagi 25 ta fe'l da dastur fe'l lemmani noto'g'ri belgilashi natijasida zamon shaklini aniqlashda ham xatoga yo'l qo'yishi mumkin: *bezadi, buradi, emadi, oshadi, qonadi, sinadi, vovadi, so'radi, to'radi, to'padi, tuzadi, tuzadi, tuzadi, to'radi, to'radi, to'radi, uzadi, voradi, yutadi, o'radi, o'tadi*. Bunday fe'l larga a-1 zamon shaklidan so'ng -di shaxs-son qo'shimchasining qo'shilgan holati bilan shakldo'shlikni yuzaga keltirgan ikkinchi fe'l lemmaga -di o'lgan zamon (shaxs-son ma'nosini ham bildiradi) shaklining qo'shilgan holatini kontekst yordamida aniqlash mumkin emas. Bu muammo sementik analizator yordamida kontekstda fe'l lemmaning boshqa tokenlarga birlashtirish imkoniyatiga qarab hal qilinishi mumkin.

XULOSA

1. Jahon tilshunosligida maunda ifodalangan zamoning obyektiv vaqtiga munosabatini belgilashda harakat-holat vaqti(H), nuqt vaqti(N) va ishora vaqti(I) kabi uch nuqta e'tiborga olinadi. Bunda nuqt momenti, harakat-holat vaqti va ishora vaqti orasidagi bir vaqtga teng kelish, oldin-keyinlik, tarkibiga kirish kabilar temporal munosabatlarni sifatida gapning zamonini belgilashda asosiy rol o'ynaydi. Korpus lingvistikasida zamon shakllarni modelashtirishda ham mana shu uch nuqta asosga olinadi.

2. O'zbek tilshunosligida zamoni ifodalovchi grammatik shakllar va ularning tasnifi eng muvazarlil masalalardan biri bo'lib kelgan. Qaysi grammatik shakllar zamon kategoriyasiga tegishli ekanligi va ularning tasnifi borasida bir to'xtamga kelinmagan. Mazkur ishda NJH uchligi asosida zamon shakllari tizimlashtirildi va o'lgan zamonga 4 xil strukturaga ega bo'lgan 11 ta grammatik shakl, hozirgi zamonga 2 xil strukturaga ega bo'lgan 11 ta grammatik shakl, kelasi zamonga 3 xil strukturaga ega bo'lgan 5 ta grammatik shakl mansubligi qayd etildi.

3. Ko'plab tasniflarda ajratilgan hozirgi-kelasi zamon tushunchasi bahasi bo'lib, obyektiv zamonda bo'lgani kabi tilda ham uch zamon: o'lgan, hozirgi va kelasi zamon ajratildi. Chunki bir grammatik shakl muayyan bir qo'llanishda faqat bir zamonga ishora qiladi, ya'ni bir voqelashda ham hozirgi, ham kelasi zamon ma'nosini anglatmaydi -a, (-y) shakli nuqt momenti ham amalda bo'lib turgan

¹⁰ Xudobekova M. 525 ta turlicha kuni mavjud bo'lgan *Erta* so'zi yigirmen kuni manasini qayta ifodalaydigan bo'lishi (amaliy) asos. -Ergamon, 2001. -s. 76.

faoliyat va holatlarni, odatiy takrorlanuvchi harakat-holatlarni, predmetlarning doimiy belgisini, o'zgarmas baqiyatlarini ifodalaganda umumiy hozirgi zamon shakli sifatida qaralishi lozim. Bu shakl nuqt momenti emas, balki undan keyin yuzaga keladigan harakat va holatlarni ifodalaganda kelasi zamon shakli sifatida baholinishi lozim.

4. Korpus matnlaridan zamoni annotatsiyalash uch xil darajada amaliy oshiriladi.

1. Grammatik daraja. Bunda matn tarkibidagi zamonga ishora qiluvchi grammatik shaklining ishonch ma'nosida asosida gapning qaysi zamonga oidligi belgilanadi.

2. Sementik daraja. Bunda grammatik shakl qo'shilayotgan asosning lektsiy ma'nosining zamon ma'nosini ifodalashiga ta'sir hisobga olinadi.

3. Kontekstual daraja. Eng murakkab daraja bo'lib, grammatik shaklning qaysi zamoni anglatayotgani haqida nuqt qurshovdan kelib chiqib xilosa chiqariladi.

5. Fe'l lektsiy ma'nosining zamon ma'nosini ifodalashiga ta'sirini o'rganish hamma fe'l ham hamma zamon shakllarini birdek qabul qila olmaydi, shuningdek, ayrim fe'l larning grammatik shakllar bilan muayyan zamon ma'nosini voqelantirishi yoki voqelantira olmaydigi bilan bog'liq jarayonlarni tushuntiradi. Fe'l sementikasining zamonga munosabatida, xususan, ko'p ma'noli fe'l larning ayrim ma'nolarining zamonga munosabatida o'ziga xosliklar mavjud. Bu o'ziga xoslik davomli zamon grammatik shakllarini qabul qilish/qilmastik, -a (-y) shakli bilan hozirgi yoki kelasi zamoni ifodalash jihatlardan muhim ahmiyatga ega.

6. Bir lahzalik, harakat-holatning oxirgi natijasini ifodalovchi fe'l lardagi "bir lahzalik" ma'nosini davomiylikka zid keladi. Shu sababli bunday fe'l larda davomli zamon shakllari bilan qo'llanmaydi. Davomiylikni ifodalovchi holat fe'l lari esa sementikasida "davomiylik" ma'nosini bildirgi sababli davomli zamon grammatik shakllarini qabul qilmaydi. Statik holat ma'nosini ifodalovchi fe'l larda -a (-y) shakli bilan asosan hozirgi zamoni ifodalasa, jismoniy harakatlarni ifodalovchi fe'l larda bu shakl bilan asosan kelasi zamoni anglatadi.

7. Ta'limiy korpus matnlaridagi zamon shakllarining ochrash chastotasi tahliil bu grammatik shakllarning tilda qo'llanilish darajasi bir xil ekanligini ko'rsatadi. Ayrim shakllar barcha nuqt ulublari doirasida, shuningdek, ham og'zaki, ham yozma nuqt shakllarida keng iste'molda bo'lgani holda, ba'zi shakllar faqat muayyan bir ulub, bir nuqt shakli doirasidagina qo'llaniladi. Ba'zilari esa tobora tarixiylashib bormoqda. Bu jarayonlarni kuzatishda va solis baholashda grammatik shakllarning matnlarda uchralishini statistik tekshirish imkoniyatini beruvchi til korpuslarining ahmiyati juda katta. Tekshirish natijalaridan til ta'limida ham foydalanish ijobiy samara beradi.

8. O'zbek tilda bir zamonga mansub grammatik shaklning kontekst ta'sirida boshqa zamoni ifodalashi ancha keng tarqalgan hodisa hisoblanadi, lekin avtomatik annotatsiyalashda dastur grammatik shaklini qoidaga ko'ra tasnifda berilgan zamon ma'nosini bilan izoblaydi. Natijada annotatsiyada xatolik kuzatiladi. Zamoni ifodalovchi grammatik shakllarning korpus matnlarida anglatgan turli ma'nosini statistik o'rganish va ta'vifdan o'rganish natijalariga tayanish shakl haqida nisbatan ishonchli ma'lumot beradi. Tahliil zamonalarning ko'chishi bilan bog'liq

misollardagi umumiyliklarni aniqlash, va bu asosda ularning modellarni ishlab chiqish orqali bu muammoni qisman hal etish mumkinligini ko'rsatdi. Biroq butun matn mazmunidan kelib chiqadigan, standart konstruksiyalarga bog'lanmagan holda bir zamon shaklining boshqa zamonni anglatish holatlari ham bor, ularni muayyan modellar doirasida qamrab olish juda qiyin.

9. Omonim zamon grammatik shakllarning zamon ma'nosini saralashda ularning so'zlagi pozitsiyasidan, polisemantik zamon shakllarining ma'nosini aniqlashda esa, standart konstruksiyalar tarkibida uchrashidan kelib chiqib morfotaktik qoidalar asosida modellar tuziladi.

10. Zamon shakllarini matn tarkibidan aniqlash, bir zamon shaklining boshqa zamon ma'nosini voqelantirishi bilan bog'liq ayrim holatlarni farqlash, omonimiya yuzaga kelganda zamon shakli vazifasida qo'llanilishini saralash maqsadida o'tgan zamon shakllari uchun 50 ta, hozirgi zamon shakllari uchun 22 ta, kelasi zamon shakllari uchun 15 ta model ishlab chiqildi. Bunda grammatik shaklining zamon kategoriyasiga mansubligini belgilashda uning shaxs-son shakllariga nisbatan joylashuvi asos vazifasini bajaradi.

Voqea-hodisalarning davriy ketma-ketligini avtomatik tahlil qilish imkoniyati yuzaga kelishi uchun kelajakda amalga oshiriladigan tadqiqotlarda tilning turli sabhlari hamkorligida matn qismlarining bir-biri bilan temporal munosabatlarini modellashtirish tavsiya etiladi.

ONE-TIME SCIENTIFIC COUNCIL ON THE BASIS OF SCIENTIFIC COUNCIL OF GRANTING SCIENTIFIC DEGREE DSc.03/30.12.2019, PHIL19.01 UNDER TASHKENT STATE UNIVERSITY OF UZBEK LANGUAGE AND LITERATURE NAMED AFTER ALISHER NAVOI
TASHKENT STATE UNIVERSITY OF UZBEK LANGUAGE AND LITERATURE NAMED AFTER ALISHER NAVOI

KHONNAZAROV ELYOR GOFUROVICH

ANNOTATION OF GRAMMATICAL TENSE FOR UZBEK LANGUAGE CORPUS

10.00.11 – Language theory, Applied and computer linguistics

DISSERTATION ABSTRACT OF DOCTOR OF PHILOSOPHY (PhD) IN PHILOLOGICAL SCIENCES



Tashkent – 2023

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The dissertation is available at the Information Resource Center of Tashkent State University of Uzbek language and literature named after Alisher Navoi (Registered with No.288). Address: 100100, Tashkent city, Yusuif Khos Hoyib street, 103. Phone: (99871) 281-42-44; (www.tsuil.uz), e-mail: monitoring@navoiy-usil.uz

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INTRODUCTION (Abstract of PhD dissertation)

Actuality and necessity of the research theme. In the world, scientific directions related to the application of information technology to linguistics began to develop from the 40s of the 20th century. As a result of this, such scientific directions, as computer linguistics, corpus linguistics, and machine translation were created. The need to develop a formal grammar for the analysis systems of these directions has arisen. By the 50s of the 20th century, automatic morphological analysis systems were developed and began to be used in the fields of natural language processing and machine translation. Determining the relation of speech to time is important in the process of morphological analysis. It is known that space and time are the fundamental form of existence, and any information, action, situation has signs of time and space. Understanding the relationship of information to time is an important condition for understanding changes in the world. Time determines the time of occurrence of certain events and situations, and thus they are arranged in sequence in memory, as well as how long they lasted. The need to ensure the automatic implementation of analyzes of the relationship of information to time increases the practical importance of the issue of annotating grammatical forms of tense.

In world linguistics, at the end of the 20th century, the creation of language corpora and their linguistic annotation became one of the urgent issues. This put the creation of programmatic and linguistic support for tagging words and grammatical forms for each language on the agenda. As a result, language corpora containing millions of words were created by the beginning of the 21st century. Most of them have the ability to analyze what time the information in the corpus refers to according to grammatical forms representing time and time expressions. Today, one of the most important tasks for the world corpus linguistics is to determine such issues as the transfer of verb tenses, whether it refers to another tense according to the context, in automatic analysis.

In Uzbek linguistics, research on computer linguistics began to be carried out from the beginning of the 21st century. While preliminary research is associated with linguistic and lexicographic research of the Uzbek language on the basis of the achievements of world computer linguistics, in recent years, special attention has been paid directly to the issues of building national and various Corps of the Uzbek language, developing morphological, semantic analyzer programs. In particular, after the task of ensuring the active integration of the state language into information technologies and communications and creating an electronic national corpus of the Uzbek language, which includes all scientific, theoretical and practical information about the Uzbek language, the work in this field accelerated even more. However, transforming the linguistic data collected as a result of more than half a century of research into a linguistic resource for a language corpus is not a task that can be covered within the framework of the few studies that have been carried out so far. "No other tool in the world can match computers in being able to process data for a

specific purpose and rapidly apply it to various aspects of human activity.² Considering the practical importance and rich capabilities of the Corps, the perfectly annotated language used in the world today, for the creation of such a corpus in our national language, there is a need to conduct research on the linguistic annotation of each category of the Uzbek language based on its uniqueness. It should be noted that all the grammatical forms denoting time are not fully linguistically annotated in the corpora of the Uzbek language that are being created in practice. Also, the fact that the issue of annotating grammatical forms representing time for the corpus of the Uzbek language has not been researched in a monographic plan so far determines the relevance of the topic.

This study, to some extent, will serve to carry out the tasks set out in decrees of President of Republic of Uzbekistan including PF-4797 of May 13, 2016 "On the organization of activity of the Tashkent State University of Uzbek Language and Literature named after Alisher Navoi", PF-5850 of October 21, 2019 "On measures to radically increase the prestige and status of the Uzbek language as the state language", PF-6084 of October 20, 2020 "On measures to further develop the Uzbek language and improve language policy in our country", PF-6097 of October 29, 2020 "On approval of the Concept for the development of science until 2030" PF-60 of January 28, 2022 "On the development strategy of New Uzbekistan for 2022-2026", resolution of PQ-4479 of October 4, 2019 "On the broad celebration of the thirtieth anniversary of the adoption of the Law of the Republic of Uzbekistan "About the State Language" and other regulations related to this activity.

Relevant research priority areas of science and developing technology of the Republic. The dissertation was completed in accordance with the priorities of the development of republican science and technology 1. "Formation of a system of innovative ideas and ways of their implementation in the social, legal, economic, cultural, spiritual and educational development of the information society and the democratic state".

Comments on scientific researches on the theme of the dissertation. In world linguistics, the study of the tense category, which is a linguistic universal, has been studied in different aspects. Among the researched works on tense as a grammatical category of the verb can be cited as an example: the works of H.Reichenbach, H.Wentrich, Z.Vendler, A.V.Bondarko, N.Hornstein, J.Allen, K.Man-lam Yip, I.V.Kornushin, B.Camrie, V.Kameyeva, A.O.Kozmin, A.A.Ziyayudinova³.

² Collins A. *Матрициальная И Корпусная лингвистика: современные направления. Тезисы доклада, выступая – доклад на ежегодной Конференции молодых лингвистов. – Челябинск, 2018. – С. 75-78.*

³ Reichenbach H. *The Notion of Verbs*. – New York: The Macmillan Company, 1947. – P. 287-298. Wentrich H. *Tempus – Deutsches und andere Wdh.*. – Stuttgart, 1984. Vendler Z. *Linguistics in Philosophy (Verbs and Nouns)*. New York: Cornell University Press, 1967. – P. 97-121. Hornstein A. *Grammatical categories in universals*. – J. Hayes, 1971. – 43 c. Hornstein A. *Towards a Theory of Temporal Linguistic Inquiry*. – 1977. – 263 c. P. 521-557. Allen J. *Towards a General Theory of Action and Time: Artificial Intelligence*. – 1984. – 83 c. P. 121-154. Man-lam Yip K. *Time, Aspect and the Cognitive Representation of Time*. *Natural Language & Theory*, 1994. – P. 26. Kornushin I. *Синтаксис времени в армянском языке*. – М.: ИИЯЛ, 1966. – 85 с.; Collins B. *Time*. Cambridge: Cambridge University Press, 1985. – P. 139. Kameyeva V. *Лингвистическая философия времени и грамматическая категория времени/Времене-категоризация: теоретический анализ и экспериментальное исследование. Автореферат диссертации на соискание ученой степени кандидата филологических наук. Челябинск, 2018. – С. 66-73. Kozmin A. *Семантический анализ времени и его грамматическая категория в армянском языке. Автореферат диссертации на соискание ученой степени кандидата филологических наук. М.: ИИЯЛ, 2008. – 21 с. Ziyayudinova A.**

Most of the research conducted on the annotation of tense forms in world corpora linguistics is based on J. Pustejovsky's Time ML annotation scheme. Such works include the researches of scientists such as M.Verhagen, G. Marsic, N. UzZaman, I.Bierkandt, V.Gast⁴. In these studies, not only the meaning of time expressed through specific grammatical forms are studied, but also the issues of modeling the meaning of time arising from the interaction of different time expressions, as well as compounds and sentences.

In Russian corpus linguistics, the researches of scientists such as V.P.Zakharov, S.Y.Bogdanova, A.B.Kubzov, Y.V.Medoshivina, D.Y.Gruzdev, I.O.Kuznetsov, I.M.Nojov are significant in that they focus on such issues as the corpus and its structure, marking standards, implementation of automatic morphological and syntactic analysis of text⁵.

In Turkology, the issue of annotating tense forms is studied within the framework of general morphological classification and automatic morphological analysis. A.V.Dibo and A.V.Sheynevich⁶ (Turkic languages, especially Khakas), E.Adali, K.Oflazer⁷ (Turkish), D.Sh.Suleymanov, A.R.Gilmullin, R.R.Gataullin⁸ (Tatar), G.G.Toroteyev, A.N.Negovizima⁹ (Yakut), A.B.Khertek, B.Ch.Orjak¹⁰ (Tuva), P.B.Jel'nov¹¹ (Chuvash), N.A. Israilova, P.S. Bakasova¹² (Kyrgyz) researched

⁴ Векторно-грамматический корпус времени в лингвистическом аспекте (на примере английского, русского и армянского языков). Автореферат диссертации на соискание ученой степени кандидата филологических наук. Челябинск, 2011. – 20 с.

⁵ Vachagan M. *Time between the lines: Unlinking a temporal clause conjoined to a mixed-tativity temporal infinitival structure*. A dissertation submitted in partial fulfillment of the requirements for the degree Doctor of Philosophy. – Walden, 2018. – 134 p. Marsic G. *Temporal processing of tense: annotation of temporal expressions, verbal events and temporal relations*. A thesis submitted in partial fulfillment of the requirements of the University of Waterloo for the degree Doctor of Philosophy. – Waterloo, 2011. – 349 p. UzZaman N. *Incorporating the temporal aspects of language*. submitted in partial fulfillment of the requirements for the degree Doctor of Philosophy. – New York, 2013. – 203 p. Gaz V. *Bankard I., Berkant O., Croating and retrieving tense and aspect annotations with GoogleAuto. A lightweight tool for multi-level annotation*. *ArXiv:1603.02332*. pdf. 3500pp arXiv:1603.02332.

⁶ Ташева И.И., Ибраимова Ю.К. Корпусная лингвистика: учебник для студентов филологических вузов – Алматы: ИТЭУ, 2011. – 61 с.; Кувшинов А.В. Круге словоупотребления существительных. – М., 2008. – 26 с.; Исраилова Н.А. Программы для работы с корпусными текстами: обзор современных корпусных инструментов. Челябинск: Издательство Южно-Уральского государственного университета, 2016. – 26 с.; Гроздев Д.Ю. Темпоральная категория времени как аллометрический индикатор грамматической структуры. – М., 2013. – 18 с.; Кузнецов И. О автоматическом определении грамматических функций в русском языке. Автореферат диссертации на соискание ученой степени кандидата филологических наук. Челябинск, 2016. – 22 с.; Исаилова Н.А. Морфологический и синтаксический анализ текста (на примере армянского языка). Диссертация на соискание ученой степени кандидата филологических наук. Челябинск, 2017. – 23 с.

⁷ Оффлазер К. *Two-level description of Turkish Morphology*. Library and Linguistic Computing. – Vol. 9, No.2. – 1994. – С. 20-30. Дибов А.В., Шейневич В.В. *Классификация временных значений глаголов в армянском языке*. – М.: ИИЯЛ, 2018. – 108 с.

⁸ Оффлазер К. *Two-level description of Turkish Morphology*. Library and Linguistic Computing. – Vol. 9, No.2. – 1994. – С. 20-30. Дибов А.В., Шейневич В.В. *Классификация временных значений глаголов в армянском языке*. – М.: ИИЯЛ, 2018. – 108 с.

⁹ Оффлазер К. *Two-level description of Turkish Morphology*. Library and Linguistic Computing. – Vol. 9, No.2. – 1994. – С. 20-30. Дибов А.В., Шейневич В.В. *Классификация временных значений глаголов в армянском языке*. – М.: ИИЯЛ, 2018. – 108 с.

¹⁰ Оффлазер К. *Two-level description of Turkish Morphology*. Library and Linguistic Computing. – Vol. 9, No.2. – 1994. – С. 20-30. Дибов А.В., Шейневич В.В. *Классификация временных значений глаголов в армянском языке*. – М.: ИИЯЛ, 2018. – 108 с.

¹¹ Оффлазер К. *Two-level description of Turkish Morphology*. Library and Linguistic Computing. – Vol. 9, No.2. – 1994. – С. 20-30. Дибов А.В., Шейневич В.В. *Классификация временных значений глаголов в армянском языке*. – М.: ИИЯЛ, 2018. – 108 с.

¹² Оффлазер К. *Two-level description of Turkish Morphology*. Library and Linguistic Computing. – Vol. 9, No.2. – 1994. – С. 20-30. Дибов А.В., Шейневич В.В. *Классификация временных значений глаголов в армянском языке*. – М.: ИИЯЛ, 2018. – 108 с.

¹³ Оффлазер К. *Two-level description of Turkish Morphology*. Library and Linguistic Computing. – Vol. 9, No.2. – 1994. – С. 20-30. Дибов А.В., Шейневич В.В. *Классификация временных значений глаголов в армянском языке*. – М.: ИИЯЛ, 2018. – 108 с.

static or dynamic action, emphasis on the subject, indirect connection to the moment of speech;

the grammatical, semantic and contextual levels of tense annotation are separated and the influence of the verb lexical meaning is revealed in the adoption of continuous tense suffixes, the contextual level of tense annotation is proved;

the applications of tense forms to situations in the language and various reasons for the degree of activity in speech are revealed, such as their occurrence in oral or written speech, their historicization, their specificity for the artistic style;

it has been proven to solve problems with homonym and poly-semantic grammatical forms based on morphotactic rules that cause an error in the program that occurs during the annotation of tense forms.

Practical results of the research work consist of the following:

it is proven that the research results are an important source for improving morphological analyzers of Uzbek language corpora;

the systematization of the grammatical forms expressing tense in the Uzbek language with the need for linguistic support is justified as an important source of information for the textbooks and manuals created in this field;

models of the use of each tense form in the text have been developed for use in tagging corpora.

Authenticity of the research results is explained by the fact that the studied materials helped to make conclusions based on the characteristics of the Uzbek language, their validity, methodological excellence, and the fact that they relied on practically proven sources in the annotation of grammatical forms representing tense for the corpus of the Uzbek language.

Scientific and practical significance of the research. The scientific significance of the results of the dissertation is determined by the fact that it acquires theoretical importance in the creation of new researches in the field of computer linguistics, and is enriched through scientific views on the formalization of the Uzbek language and the creation of a computer language.

The practical significance of the research is determined by the fact that the materials, results and conclusions contained in it serve as a source and material when conducting special courses, special seminars in the discipline of Corpus Linguistics, undergraduate and graduate education in Uzbek linguistics, and also serve as a basis for conducting research on morphological tagging of words.

Implementation of the research results. The conclusions about the influence of the verb lexical meaning in the adoption of continuous tense suffixes, solving problems that cause error in the program associated with homonymous and polysemantic grammatical forms occurring in the process of annotation of tense forms on the basis of morphotactic rules were used in the practical grant project "Creation of the educational corpus of the Uzbek language" numbered AM-FZ-201908172 implemented in 2020-2022 at Tashkent State University of Uzbek Language and Literature named after Alisher Navoi (Reference number 01-3220 of the Tashkent State University of Uzbek Language and Literature named after Alisher Navoi dated November 24, 2022). As a result, a linguistic support was developed for annotating tense forms in the corpus text.

The conclusions about features as direct observation or indirect notification, specificity for static or dynamic actions, description of the subject, indirect connection to the moment of speech, which differ from others of the grammatical forms expressed in Uzbek were used in the practical grant project "Creating an electronic platform that develops oral and written speech competences of primary school pupils of general secondary education" numbered PZ-202004165 implemented in 2021-2023 at Tashkent State University of Uzbek Language and Literature named after Alisher Navoi (Reference number 01-3220 of the Tashkent State University of Uzbek Language and Literature named after Alisher Navoi dated November 24, 2022). As a result, the platform is filled with information about the use of tenses in various speech situations.

Information about the importance of language Corps, the accessibility of annotated Corps to its users was used in the preparation of the issue of the radio program broadcast on the Uzbek National Broadcasting Corporation "Uzbekistan" on the 21st of October (Reference number 04-32-1127 of the National Broadcasting Company of Uzbekistan "Uzbekistan" radio channel dated November 15, 2022). As a result, the content of this broadcast is enriched with scientific evidence.

Approbation of the research results. The results of this research were presented at 3 international and 6 national scientific-practical conferences.

Publication of the research results. A total of 16 scientific works were published on the topic of the dissertation, of which 7 articles were published in scientific publications recommended to publish the main scientific results of the dissertation of the Higher Attestation Commission of the Republic of Uzbekistan, including 3 in international and 4 in republican journals.

The structure and scope of the dissertation. The dissertation consists of an introduction, three chapters, a conclusion, a list of used literature and an appendix. The total volume of the dissertation is 159 pages.

THE MAIN CONTENT OF THE DISSERTATION

The introductory part substantiates the actuality and necessity of the research theme, the degree to which the problem has been studied, the aims and functions of the research, the object and subject of the research, its relevance to the priorities of science and technology, scientific novelty and practical results. Information on the implementation of research results in practice, approbation of research results, published works and the structure of the dissertation.

The first chapter of the dissertation is entitled "Theoretical and methodological foundations of the category of tense". In the first part of the chapter entitled "Interpretation of the tense category in world linguistics", information is given about the study of tense, which began in ancient periods, based on the direction and goals of the schools formed in different eras, and about the general models of tense. In many researches in world linguistics, it has become a tradition to study time as a unity of grammatical, lexical, syntactic tools that serve to realize real time in language – as a whole temporal category.

H. Reichenbach explained for the first time that there are three points on the time line, and different time meanings are expressed according to the sequence of these points¹⁹. He knows that the problems in explaining the meaning of the tenses close to each other (for example, Simple past and Present perfect) in grammar books were the result of not distinguishing between three points of time. The scientist emphasizes the following as three points:

1. Point of speech – S.
2. Point of event – E.
3. Point of reference – R.

I. Kormushin, who specially studied the verb tenses in Altai languages, distinguishes absolute and relative tenses in the system. According to the scientist, the past, present, and future tenses are absolute tenses, and relative tenses arise from their relationship with each other. In particular, three relative tenses are formed from the absolute past tense: the past tense relative to the past tense, the present tense relative to the past tense, and the future tense relative to the past tense. In the same order, three relative tenses are formed from the present and future absolute tenses. Thus, he recommends a system of three absolute and nine relative – twelve tenses in all – for the Altai languages²⁰. In our opinion, although this approach of I. Kormushin is based on systematicity, it was not widely popular because it could not be fully applied to all Altaic languages. Because some of the relative tenses are created artificially, they do not have their expression in all languages.

The study of the grammatical tense in cooperation of different levels caused its essence to be revealed more clearly. In turn, most researchers have emphasized that the grammatical tense forms of the verb occupy a central place in this temporal field. Today, great importance is attached to the study of this category from the point of view of such sciences as psycholinguistics, neurolinguistics, corpus linguistics, linguoculturology.

The second part of the first chapter is called "The issue of tense annotation in corpus linguistics". In this chapter, the work done on annotating tense forms and creating their models in world and Uzbek corpus linguistics and the problems in this regard are analyzed. In the world, the modeling of the tense category is connected with the need to create a formal grammar, and this issue was also important for the practical areas of computer linguistics, such as machine translation and automatic text analysis. The subsequent advent of large-scale language corpora also led to the improvement of technologies for automatic analysis of time-related properties of information in texts. While tacit schemes such as TIMEX, TIME2, TIDE, TIMEX 2, STAG (Sheffield Temporal Annotation Guidelines) were used in the identification and annotation of temporal expressions within the text, Time ML, ISO-Time ML schemes were later developed by James Pustejovsky, which, as a result of their integration, could determine verb tenses, as well as annotate tense relations between several actions and states.

¹⁹ Reichenbach H. *Elements of Symbolic Logic (The Tenses of Verbs)*. – New York: The Macmillan Company, 1947. – P. 387–398.

²⁰ Кормушин И. Категория времени в алтаических языках. – М: Наука, 1984. – С. 6–7.

In Great Britain, G. Marsic studied in a monographic way the issue of automatic annotation of time-related words, verb tenses, actions-states and time-related features of the text in general²¹. This research is in the direction of automatic natural language processing, and a complex analysis of the tense category was carried out on the example of English language materials. In studying the characteristics of the text related to objective time, it is shown the importance of not only verb tenses, but also lexical and morphological aspects of verbs, tense nouns and adverbs, and time-meaning conjunctions.

From the works devoted to the automatic analysis of the morphology of Turkic languages, it can be concluded that the analysis process is based on the grammatical dictionary, word-form model and morphotactic rules. Morphotactic rules mean specific rules for joining the suffix to the base, as well as the selection of appropriate allomorphs based on the characteristics of the base (for example, adding the past tense form of –gan to bases ending with the consonant k in the form –kan, bases ending with the consonant q in the form –qan) is implied. Also, FST (Finite State Transducer) computer model is widely used for automatic morphological analysis systems of Turkic languages.

In Uzbek corpus linguistics, thoughts on the annotation of tense forms are also expressed in research within the framework of the issues of morphological tagging and morphoanalyzer development. In her dissertation on "Linguistic support of the morphological analyzer of the Uzbek language", Sh. Hamroyeva emphasized the need to strictly define the grammatical categories for the morphoanalyzer of the Uzbek language based on the rules of the Uzbek language, and identified 11 grammatical categories in the Uzbek language, including, also indicates the tense category²². The dissertation provides information on morphological classification, linguistic support of morphoanalyzers, and defines the general principles of research in this direction. After all, there are peculiarities in the use of grammatical forms of each category, and their deep research and perfect description in the corpus will lead to the improvement of morphoanalyzers.

S. Murtamedova worked on the creation of linguistic support for computer program based on action verbs and their valence possibilities. The work also shows the influence of the lexical meaning on the combination of verbs with grammatical forms²³.

In her research on the automatic analysis and editing of Uzbek language texts, M. Abjalova also focuses on the tense forms within the morphological stage of the analysis²⁴. She distinguishes 13 forms for the past tense, 6 for the present tense, and 9 for the future tense. In the "Dictionary of verb forms" compiled by Sh. Hamroyeva,

²¹ Marsic G. Temporal processing of tense annotations: verb forms and temporal relations. A thesis submitted in partial fulfillment of the requirements of the University of Waterloo for the degree Doctor of Philosophy. – Waterloo, 2011. – 349 p.

²² Hamroyeva Sh. *Uzbek tili morfologiya va morfotaktika*. – Toshkent: Fan, 2011. – 115 b.

²³ Murtamedova S. *Uzbek tili grammatikasi va morfologiyasi*. – Toshkent: Fan, 2006. – 115–116 b.

²⁴ Abjalova M. *Uzbek tili morfologiyasi va grammatikasi*. – Toshkent: Fan, 2011. – 115–116 b.

O. Kholiyrov, G. Abdullaimova, it is said that there are 49 forms of the tense and 66 forms with their variants²⁴.

N. Abdurakhimova's monograph, "Computer models of the Uzbek language electronic corpus", provides information on rule-based, probabilistic, and hybrid-based methods of tagging, and the Uzbek language Corpus (uzbekcorpus.uz) based on the scientific justification that 26985 verb-specific combinations were generated²⁵.

The third part of the first chapter is called "Classification of tense forms in Uzbek linguistics". In Uzbek linguistics, grammatical forms representing tense and their classification have been one of the most controversial issues. In the work carried out on the basis of the formal-descriptive method, grammatical forms representing tense were determined and their meanings in various speech applications were explained. A. Hojiyev pays attention to the list of grammatical forms expressing time and the diversity in their classification: "In addition to various textbooks and manuals, some monographs, as well as comparative works, four candidate's dissertations were approved on the topic of verb tenses in the Uzbek language. However, not only about the specific characteristics of each tense form, even about which tense of the verb has what forms in the Uzbek literary language, there is no consensus until now²⁶. These comments of the linguist are still valid today. For example, A. Soliymanov shows 24 invariant synthetic and analytical forms that form the past tense in the book "Verb Tenses"²⁷, and A. Hojiyev notes 10 such forms in "Uzbek Language Grammar"²⁸ (1975). The number of past tense forms in A. Gulomova's work "Verb" is 7²⁹, and in the textbook "Current Uzbek Literary Language I (Morphology)" published in 1966, their number is 12³⁰. Similar variations are observed in the amount of other tenses. In our opinion, one of the main reasons for this is the close connection of the categories of tense and mood in the Uzbek language and the fact that grammatical forms express the meaning of both tense and mood. In the system-structural approach were differentiated the linguistic and speech aspects of the tense forms, and were summarized various speech meanings. In particular, the issues of revealing the general meaning of tense forms and the manifestation of certain aspects of this general meaning as a special meaning in their speech applications were analyzed in the works of scientists such as G. Zikrillayev³¹, B. Menglijev³², Sh. Shahobiddinova³³, N. Musulimova³⁴.

²⁴ Hojiyev O., Xolijayev O., Abduhalimova G. O'zbek tili haqida 49 ta shakllar haqida ("49 shakllar") // "Uzbekiston" 2011. - B. 10.

²⁵ Abdurakhimova N. O'zbek tili elektron korpusining lingvistik asoslarini - Tashkent, 2011. - B. 75.

²⁶ Soliymanov A. Grammatika. - Tashkent, 1973. - B. 121.

²⁷ Gulomova A., Xolijayev O., Hojiyev A. O'zbek tili grammatikasi. - Tashkent, 1975. - B. 77.

²⁸ Hojiyev A. O'zbek tili grammatikasi. - Tashkent, 1975. - B. 12-13.

²⁹ Gulomova A. O'zbek tili grammatikasi. - Tashkent, 1975. - B. 218-219.

³⁰ Gulomova A. O'zbek tili grammatikasi. - Tashkent, 1975. - B. 102.

³¹ Menglijev B. O'zbek tili grammatikasi. - Tashkent, 1975. - B. 102.

³² Shahobiddinova S. O'zbek tili grammatikasi. - Tashkent, 1975. - B. 102.

³³ Musulimova N. O'zbek tili grammatikasi. - Tashkent, 1975. - B. 102.

In our opinion, based on the relationship between the moment of speech (S), the time of reference (R), and the time of event (E), the classification of forms of tenses can be carried out as follows:

I. Past tense forms:

- 1.1. Past tense forms representing the structure S>R=E: -di, -b (-ib), edi.
- 1.2. Past tense form representing structure S=R>E: -gan (-kan, -kan).
- 1.3. Past tense forms representing the structure S>R>E: -gan edi (-kan edi, -kan edi), -b edi (-b edi).

1.4. Past continuous forms representing the structure S>R<E: -y edi (-ar edi), -yotgan edi (-ayotgan edi), -yotib edi (-ayotib edi), -yotir edi (-ayotir edi), -moqda edi, -moqda edi.

II. Present tense forms:

- II.1. Simple present tense form representing the structure S=R=E: -a (-y).
- II.2. Present continuous forms representing the structure S=R<E: -yap, -yotib (-ayotib), -yotir (-ayotir), -moqda, -yotgan. Also, the use of the verbs *yurmoq*, *turnmoq*, *o'tirmoq*, *yurmoq* as auxiliary verbs and verbs of state in the meaning of the present tense also corresponds to this structure.

III. Future tense forms:

- III.1. Future tense forms representing the structure S<R=E: -a (-y), -r (-ar), -yidigan (-adigan), -ajak (-yajak), -gay (-kay, -qay).

Also, it can be expressed the meanings of result and duration in the future tense. These meanings are created using the forms -gan/-kan/-kan, -(a)yotgan and the verb *bo'l*. In this case, for the meaning of the result the forms -a-ar are added to the verb *bo'l*, which comes after the form -gan/-kan/-qan. The meaning of the result in the future tense can be expressed through the structure S<R>E. For the meaning of continuity in the future tense the forms -a-ar are added to the verb *bo'l*, which comes after the form -ayotgan. It is understood that the event begins after the moment of speech, and the sign continues in reference time. In this case, it can be expressed through the structure S<R<E.

The second chapter of the dissertation entitled "Levels of annotation of tense", the first part of this chapter is called "Grammatical level of tense annotation". Grammatical forms expressing tense are the primary and most important tool in determining the relation of the sentence to the moment of speech. Summarizing the classifications of tense forms in Uzbek linguistics, we accepted the units listed in tables 2, 3, 4 as grammatical forms of tense. It should be noted that the level of activity of the forms expressing the tense is different in the language. While some forms are very widely used, some forms are used only within a certain style, genre. Linguistic corpora are of great importance in observing these processes and making an objective assessment. We have analyzed the frequency of use of tense forms in the texts of some language corpora that are posted on the Internet and are used in practice today. In our analysis, we mainly relied on the texts of the educational corpus of the Uzbek language (uzschoolcorpus.uz), which currently has a relatively large vocabulary. The results showed that past tense forms were used 4363937 times

³⁴ Musulimova N. O'zbek tili grammatikasi. - Tashkent, 1975. - B. 102.

(56%), present tense forms were used 2854941 times (36%) and future tense forms were used 615617 times (8%) in these corpus texts.

The second part of the chapter is called "Semantic level of tense annotation" and it analyzes the influence of the lexical meaning of the verb in accepting the grammatical forms expressing the tense and expressing the meaning of the tense. In world linguistics, this issue is solved by dividing verbs into aspectual groups. In Uzbek linguistics, research on verb tenses has not paid special attention to this issue. Only the issue of the verbs *yolmoq*, *yarmoq*, *turnoq*, *o'irimoq* with the form -ib expresses the present tense in a unique way. According to the lexical meaning, we have divided the verbs that have specific features in taking tense forms into the following semantic groups:

1. Verbs expressing the final result of a momentary action-state: *topmoq*, *yo'g'omoq*, *payqamoq*, *qo'g'atmoq*, *cherimoq*, *uyg'otmoq*, *tarimoq*, *chiqarmoq*, *irimoq*.
2. State verbs expressing continuity: *yarmoq*, *turnoq*, *yotmoq*, *o'irimoq*, *irimoq*.
3. Verbs expressing state: *sevinmoq*, *bilmoq*, *xursand bo'lmoq*, *ishlammoq*, *nifratlammoq*.
4. Verbs expressing physical action: *harmoq*, *ketmoq*, *yarmoq*, *chopmoq*, *qovamoq*.

Verbs expressing momentary actions do not have the meaning of duration. They represent short momentary actions indicating a certain point on the axis of time and are not used with continuous tense forms. However, polysemantic verbs can take these forms in one meaning without taking the continuous tense form in another meaning. For example, the verb *topmoq* with the meanings of "1) To meet a lost, generally sought (in search) thing or person. 2) To catch suddenly" doesn't use in continuous tense. But it accepts continuous tense forms with the meanings of "3) To discover as a result of research. 4) Determine the unknown. 5) In general, to have, to achieve as a result of work, some reason, etc."¹⁵ which is noted in the dictionary. In particular, the verb *topmoq* is used in the present continuous tense in 839 places in the text of the Educational Corpus, and in the documents it represents one of the 3rd, 4th, 5th meanings in the explanatory dictionary. For example: *Yitimsiz tarimog'lar orqali hokimlik va boshqaruv idoralariga yo'llanuvog'an murijatlilar o'z yechimini topyaptimi? O'quv-seminarlarida shu kabi masalalar muhokamalar, markazida bo'ladi.* (32.17) It should be noted separately that when these types of verbs are used in the negative form, disappears the meaning of a short moment, instantaneous action and acquires duration. Therefore, they can accept the present continuous tense forms with the negative form. For example: *O'zimda ham savodli mutaxassislar juda ko'p, ularni hech kim puyqatmaypti.* (kun.az).

The fact that the verbs *turnoq*, *yarmoq*, *o'irimoq* with the -ib form mean the present tense is related to their lexical meaning, and they express the meaning of duration when they are state verb and auxiliary verb. When expressing the meaning of action, it means the past tense with the form -ib. We have analyzed the meaning of tense understood from the cases of these verbs with the suffix -ib in

¹⁵ Ushbu maqolada muhokama qilinayotgan IV korpus - Tomonidan 53472 danastamang'ul mashqiyatlar, 2008 - E.144.

¹⁶ That dictionary, -E.144-149.

the texts of the educational corpus. The results of the analysis are shown in Table 2.1¹⁷.

№	Verb form	With the meaning of the past tense		With the meaning of the present tense	
		Amount	In percent	Amount	In percent
1	yur+ib+personality	34	2%	1509	98%
2	tur+ib+personality	45	0,2%	24183	99,8%
3	o'fir+ib+personality	4	0,5%	849	99,5%
4	yot+ib+personality	12	0,8%	1427	99,2%
Total		95	0,3%	27968	99,7%

It can be seen from the table that the given verb forms are rarely used in the meaning of past tense.

The third part of the second chapter is called "Contextual level of tense annotation". In Uzbek linguistics, the importance of the context in the use of tense forms is partially studied under such topics as stylistic features of tenses. In this regard, the researches of A.Gulomov, A.Hojiyev, M.Sodikova, J.Abdullajonova are important¹⁸. In the transition of tenses, it is taken into account that the grammatical form, under the influence of the context, expresses the meaning of another tense instead of its main meaning. For example, the form -di can also express actions in the future tense at the point closest to the moment of speech under the influence of the context. The action of leaving occurs after the moment of speech in the word *ketdim* used in the sentence "Bo'pti, men ketdim", which is often found in our speech, and in the analysis it is correct to show it as a verb in the future tense. There is also a semantic difference between the word form *ketdim* in the example, compared to *ketaman*, which is represented by the suffix -a of the future tense, and *ketdim* expresses that the action occurring in the future tense is closest to the moment of speech.

The third chapter of the dissertation is called "Annotation of tenses in the Uzbek language". Its first chapter is called "Morphotactic rules in the annotation of tenses". In the process of annotating tense forms, their ability to connect to the base, preceding and following suffixes - morphotactic rules is of particular importance. The term morphotactic refers to the valence of grammatical form. In particular, the automatic differentiation of the meaning of homonymous and polysemantic grammatical forms based on their position in the word is carried out on the basis of morphotactic rules in many cases. The location of the grammatical forms expressing tense in the verb is determined based on the following general model:

Verb-tema+voice form+negative form+tense form+personality form+particle.

¹⁷ The results were obtained between February 1 and February 12, 2012.

¹⁸ Gulomov A. - Tomonidan 1994 - E.33; Hojiyev A. - Tomonidan 1975 - E.21-23; Abdullajonova J. - Tomonidan 1993 - E.106-108.

We expressed the language units in the model with symbols, as given in previous works¹¹ in this direction, that is, we denoted verb lemma with "P", voice form with "N", negative form with "BB", the tense form with "Z", and the personality form with "Sb". While it is a strict rule that some parts are included in the model, there is a possibility that some parts will fall out. In order to prevent the number of models from increasing, a sign \downarrow was placed in front of the symbol representing grammatical forms that are likely to be dropped. In annotation, information about the tense is expressed in abbreviated symbols. In researches in Uzbek corpus linguistics, "Z1" is used for past tense, "Z2" is used for present tense, and "Z3" is used for future tense. Each form of the tense and its allomorphs, as well as variants, must have a separate symbol. The allomorphs of the grammatical form are given with the abbreviation "al", and the added or separated variants are given with the abbreviation "var". The first number in bracket represents the number of the grammatical form of the tense, the number after the abbreviation "al" represents the number of the allomorph, and the number after the abbreviation "var" represents the number of the variant of the grammatical form.

In the second part, called "Annotation of past tense forms", each grammatical form of the past tense was explained on the basis of different signs, symbols were attached to each form. The past tense is distinguished from other tenses by the large number of grammatical forms and the high frequency of their use in texts. The number of grammatical forms representing the past tense is 11, and their number with allomorphs and variants reaches 28 (Table 2).

Table 2

L	Past tense forms	Symbols
1.1	-di	Z1(1)
1.2.1	-b	Z1(2, al1)
1.2.2	-ib	Z1(2, al2)
1.3.1	-gan	Z1(3, al1)
1.3.2	-kan	Z1(3, al2)
1.3.3	-qan	Z1(3, al3)
1.4	edi	Z1(4)
1.5.1.1	-gan edi	Z1(5, al1, var1)
1.5.1.2	-gandi	Z1(5, al1, var2)
1.5.2.1	-kan edi	Z1(5, al2, var1)
1.5.2.2	-kandi	Z1(5, al2, var2)
1.5.3.1	-qan edi	Z1(5, al3, var1)
1.5.3.2	-qandi	Z1(5, al3, var2)
1.6.1	-b edi	Z1(6, al1)
1.6.2	-ib edi	Z1(6, al2)
1.7.1.1	-t edi	Z1(7, al1, var1)

¹¹ Абдулова М.А. Ушбеқ тилдаги узатмаган ва узатмаган шаклларнинг грамматик ва лексик маъноси ва таркиби. Ўзбекистон Республикаси тилшунослик институти ахборот-коммуникация технологиялари институти. Тошкент, 2019. – 104 б.; Xolmurodov Y. Syfiyat tana muhim omil sifatida o'zlashtirilgan muhitdagi o'zlashtirilgan fikrning ifodasi. (PhD) diss. – Tashkent, 2021. – 6. 69.

1.7.1.2	-tdi	Z1(7, al1, var2)
1.7.2.1	-ar edi	Z1(7, al2, var1)
1.7.2.2	-ardi	Z1(7, al2, var2)
1.8.1.1	-yotgan edi	Z1(8, al1, var1)
1.8.1.2	-yotgandi	Z1(8, al1, var2)
1.8.2.1	-ayotgan edi	Z1(8, al2, var1)
1.8.2.2	-ayotgandi	Z1(8, al2, var2)
1.9.1	-yotib edi	Z1(9, al1)
1.9.2	-ayotib edi	Z1(9, al2)
1.10.1	-yotir edi	Z1(10, al1)
1.10.2	-ayotir edi	Z1(10, al2)
1.11	-tmoqda edi	Z1(11)

50 models were developed within the framework of past tense forms. For example, the annotation for the -di following models were formulated:

-di form. This form of the past tense is active according to the frequency of use, and is used to express actions and situations that happened before the moment of speech and were directly observed by the speaker. The -di form is added in the same -di case in the modern Uzbek literary language, regardless of whether the part to which it is joined ends with a vowel or a consonant. The expression of present and future tenses through this form shows that it has a polysemantic nature. It also enters into a homonymic relationship with the form -di, meaning personality. There is a case where the tense form -di expresses both tense and personality meaning in the third person, and it is permissible to pay special attention to this in modeling. Differentiation of these cases through models serves to improve the quality of automatic analysis.

Using the following models, it is possible to distinguish the homonymy between the tense form -di and the personal suffix -di, as well as to model the case of the meaning of the personality meaning of the tense form -di in the third person:

a) if the personality suffix is added after the form -di, then -di is the past tense form:

If $F = \downarrow N + \downarrow BB + di + Sb1$, then "di = Z1(1)"; For example: *borderim*

b) if -(ib), -a, -y, -(a)yotib are added before the form -di, then -di is a personality suffix:

If $F = \downarrow N + \downarrow BB + (ib/ay/(a)yotib) + di$, then "di = Sb2"; For example: *borderil, yozadi, o'qiydi*

d) if the -di form is not preceded by -(ib), -a, -y, -(a)yotib tense forms and there is no grammatical form after it, or -lar form occurs, or if the particle occurs, -di means tense and personality:

If $F = \downarrow N + \downarrow BB + di + O/lar/particle$, then "di = Z1(1) and Sb". For example: *o'qidi, yozilmoqda, borderim*

It is possible to model some of the cases of meaning of the future tense under the influence of the context of the form -di. Before the construction of the model, examples of the use of a grammatical form in a certain combination are collected, the

percentage of tenses understood from the examples is determined, and a model is developed that can generalize them. For example, in the texts of the educational corpus, the form -di used together with the suffix -(i)b in the combination of *nima qilidim/nima qilidik* means the future tense in 97% of cases, and it can be modeled.

If the suffix -(i)b is followed by the combination of *nima qilidim/nima qilidik*, the form -di means future tense:

IFF+|N+(i)b-nima qil+di+in/nima qil+di+k, then "di=Z3".

In the third part of the chapter called "Annotation of present and future tense forms", 22 models were developed for present tense forms listed in Table 3 and 15 models were developed for future tense grammatical forms listed in Table 4.

Table 3

II	Present tense forms	Symbols
II.1.1	-y	Z2(1.a11)
II.1.2	-a	Z2(1.a12)
II.2.	-yap	Z2(2)
II.3.	-moqda	Z2(3)
II.4.1	-yotib	Z2(4.a11)
II.4.2	-ayotib	Z2(4.a12)
II.5.1	-yotir	Z2(5.a11)
II.5.2	-ayotir	Z2(5.a12)
II.6.1	-yotgan	Z2(6.a11)
II.6.2	-ayotgan	Z2(6.a12)
II.7.1	-yotgan	Z2(7.a11)
II.7.2	-ayotgan	Z2(7.a12)
II.8.	Yurib	Z2(8)
II.9.	turib	Z2(9)
II.10.	Yotib	Z2(10)
II.11	o'tirib	Z2(11)

Table 4

III	Future tense forms	Symbols
III.1.1	-y	Z3(1.a11)
III.1.2	-a	Z3(1.a12)
III.2.1	-r	Z3(2.a11)
III.2.2	-ar	Z3(2.a12)
III.3.1	-yotgan	Z3(3.a11)
III.3.2	-ayotgan	Z3(3.a12)
III.4.1	-yajak	Z3(4.a11)
III.4.2	-ajak	Z3(4.a12)
III.5.1	-gay	Z3(5.a11)
III.5.2	-kay	Z3(5.a12)
III.5.3	-qay	Z3(5.a13)

The present tense serves as a basis in defining other tenses as it corresponds to the moment of speech. Grammatical forms of present tense not only express the duration of the action in a dynamic nature, but also refer to cases that, in general, are practiced in the moment of speech in a static way, denoting the constant characteristics of the subjects. Below, we focus on the annotation of the -a-y form, which has the highest frequency of use among both present and future tense forms. The form of the present tense -a-y expresses actions that are active at the moment of speech, that are repeated, statically exist, as well as express the permanent characteristics of subjects, usual procedures. When the meaning of the present tense is expressed with the form -a-y, the meaning of the state and activity is understood rather than the meaning of the action from the base of the verb.

When annotating the present tense meaning of the form -a-y in the verb structure, it is necessary to pay attention to the homonymic and polysemantic features of this form -a-y can be used to form the present tense, the future tense, the lexical form of the verb, the adverbial form of the verb.

Personality suffixes act as a filter in differentiating the formation of the form -a-y in the adverbial form or present tense form, as well as in the case of the formation of the imperative-demanding mood of the -y. If -a-y is followed by personality suffixes, then -a-y is present tense; otherwise -a-y is adverbial form or -y is imperative.

IFF+|N+|BB+y+Sh2, then "y=Z2(1.a11)".

IFF+|N+a+Sh2, then "a=Z2(1.a12)".

When we analyzed the use of the -a-y form as a tense suffix in the texts of the educational corpus, we saw that it was used mostly for the meaning of the present tense (75%). The meaning of the future tense is mainly expressed under the influence of special lexical units referring to this tense in the sentence (25%). So, quantitatively, pay attention to the priority of the expression of the meaning of the present tense through the form -a-y, and in modeling connect the expression of the meaning of the future tense with -a-y to special keywords that refer to this tense. M. Hakimova includes the lexemes *ertaga, endi, endilikda, endigina, keyin, keyinchalik, so'ng, so'ngra, haliqamom* among future tense adverbs⁴⁰. Also, lexemes with the meaning of time, such as *yapilda, tezda, tez orada* influence the future tense meaning of the form -a-y. By summarizing them, it is possible to form a list of units referring to the future tense (KZIQB).

Units referring to the future tense (KZIQB)=*ertaga/endi/ endilikda/endigina/keyin/keyinchalik/so'ng/so'ngra/haliqamom/yapilda/tez/tezda/tezda*

If KZIQB+F+|N+|BB+y+Sh2, then "y=Z3(1.a11)".

If KZIQB+F+|N+a+Sh2, then "a=Z3(1.a12)".

As a result of adding the tense form -a to some verb bases, it occurs homonymy with another verb lemma. In the following 25 verbs in the "Explanatory Dictionary of the Uzbek Language", the program may also make a mistake in determining the tense

⁴⁰ Хакимова М. Ҳақиқатда вақт баъзан ҳам қўлдан кетмайди. Ўзбекистон Республикаси тилишунаси тилишунаси. Тошкент: Фан ва адабиёт нashриоти, 2014. - Б. 23.

form as a result of incorrectly defining the verb lemmas: *bez-od*, *bur-od*, *en-od*, *o'st-od*, *qo-nat*, *sin-od*, *sv-sad*, *so'rad*, *top-ud*, *til-od*, *to-g-od*, *ru-t-od*, *tu-y-od*, *tu-za-d*, *tus-h-od*, *to'lad*, *us-od*, *uv-od*, *uv-od*, *uv-od*, *uv-od*, *uv-od*, *v-od*, *v-od*, *v-od*. It is impossible to distinguish past tense form -di (also meaning personality) from personality form -di (added after -a), which creates homonymy to such verbs without the help of context. This problem can be solved with the help of a semantic analyzer depending on the possibility of combining the verb lemma with other tokens in the context.

CONCLUSION

1. In world linguistics, three points such as time of event (E), time of speech (S) and time of reference (R) are considered when defining the relation of the tense expressed in the text to objective time. In this case, moment of speech, the time of event and the time of reference perform the main task in determining the tense of the sentence as temporal relations such as coming to the same time, before-after, entering into the composition. These three points are used as a basis in many studies in the modeling of tenses in corpus linguistics.

2. In Uzbek linguistics, grammatical forms representing tense and their classification have been one of the most controversial issues. There is no consensus on which grammatical forms belong to the tense category and their classification. In this work, tense forms were systematized based on the SRE triad and it was said 11 grammatical forms with 4 structures belong to the past tense, 11 grammatical forms with 2 structures to the present tense and 5 grammatical forms with 3 structures belong to the future tense.

3. The concept of present-future tense separated in many classifications is controversial, as in the objective tense, three tenses are distinguished in the language: past, present and future tense. Because one grammatical form refers to only one tense in a certain use, that is, it does not mean both present and future tense in one occurrence. The form -a, (-y) should be considered as a general present tense form when it expresses the activities and situations that are in effect at the moment of speech, the usual recurring actions, the constant sign of objects, and unchanging truths. This form should be evaluated as a form of the future tense when it expresses the actions and situations that occur after it, not at the moment of speech.

4. Annotation of tense is carried out at three different levels:
 1. Grammatical level. In this case, based on the linguistic meaning of the grammatical form, which refers to the tense in the text, a conclusion is drawn about the sentence belongs to which tense.

2. Semantic level. In this, attention is paid to the influence of the lexical meaning of the basis on which the grammatical form is added on the expression of the meaning of the tense.

3. Contextual level. Being the most complex level, a conclusion is made based on the context of which tense the grammatical form represents.

5. The study of the influence of the verb lexical meaning on the expression of the meaning of the tense explains the processes associated with the fact that not all

verbs can equally perceive all forms of the tense, as well as the inability of certain verbs to realize or realize the meaning of a certain tense with grammatical forms. There are peculiarities in the tense relationship of verb semantics, in particular, in the relationship of certain meanings of polysemantic verbs to the tense. This feature is important from the aspects of accepting/not accepting the grammatical forms of the continuous tense, expressing the present or future tense with the form -a (-y).

6. The meaning of "momentary" in verbs expressing the final result of a momentary action is contrary to duration. Therefore, such verbs are not used with continuous tense forms. Verbs expressing continuity do not accept grammatical forms of the continuous tense because they have the meaning of "continuity" in their semantics. The verbs expressing the meaning of a static state mainly express the present tense with the form -a (-y), while the verbs expressing the physical movement mainly express the future tense with this form.

7. The analysis of the frequency of occurrence of tense forms in the texts of the educational corpus showed that the degree of use of these grammatical forms in the language is different. While some forms are widely used in all speech styles, as well as in both oral and written forms of speech, some forms are used only within a certain style, one form of speech. Some of them are becoming more and more historic. Language corpora, which provide the opportunity to statistically check the occurrence of grammatical forms in texts, are of great importance in observing these processes and making an objective evaluation. Using the test results in language education will have a positive effect.

8. In the Uzbek language, it is a very common phenomenon that a grammatical form belonging to one tense expresses another tense under the influence of context, but in automatic annotation, the program interprets the grammatical form with the meaning of the tense given in the classification according to the rule. As a result, an error is observed in the annotation. Relying on the results of statistical study and descriptive study of different meanings of grammatical forms expressing tense in corpus texts gives relatively reliable information about the form. The analysis showed that it is possible to partially solve this problem by identifying commonalities in examples related to the transition of time and developing their models on this basis. However, there are cases where one tense form means another tense without being tied to standard constructions, arising from the content of the whole text, which is very difficult to cover within the framework of specific models.

9. Filtering the tense meaning of homonymous tense grammatical forms, models are created based on their position in the word and determining the meaning of polysemantic tense forms, they meet in standard constructions based on morphotactic rules.

10. 50 models for past tense forms, 22 models for present tense forms, 15 models for future tense forms have been developed for purposes of identifying tense forms from the context, distinguishing certain cases associated with the realization of the meaning of one tense form to another, filtering its application in the function of the tense form when occurs homonymy. In this case, its location in relation to personality forms serves as the basis for determining whether a grammatical form belongs to the tense category.

In order to enable the automatic analysis of the periodic sequence of events, it is recommended to model the temporal relations of the text parts with each other in the cooperation of different fields of the language in the future researches.

РАЗОВЫЙ НАУЧНЫЙ СОВЕТ НА ОСНОВЕ НАУЧНОГО СОВЕТА
DSc.03/30.12.2019.F.1.19.01 ПО ПРИСУЖДЕНИЮ УЧЕНЫХ СТЕПЕНЕЙ
ПРИ ТАШКЕНТСКОМ ГОСУДАРСТВЕННОМ УНИВЕРСИТЕТЕ
УЗБЕКСКОГО ЯЗЫКА И ЛИТЕРАТУРЫ ИМЕНИ АЛИШЕРА НАВОИ
ТАШКЕНТСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ
УЗБЕКСКОГО ЯЗЫКА И ЛИТЕРАТУРЫ ИМЕНИ АЛИШЕРА НАВОИ

ХОННАЗАРОВ ЭЛЁР ГОФУРОВИЧ

АННОТИРОВАНИЕ ГРАММАТИЧЕСКИХ ФОРМ ВЫРАЖЕНИЯ
ВРЕМЕНИ КОРПУСА УЗБЕКСКОГО ЯЗЫКА

10.00.11 - Теория языка. Прикладная и компьютерная лингвистика

АВТОРЕФЕРАТ ДИССЕРТАЦИИ ДОКТОРА ФИЛОСОФИИ (ФФД)
ПО ФИЛОЛОГИЧЕСКИМ НАУКАМ

Ташкент – 2023

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С диссертацией можно ознакомиться в Информационно-ресурсном центре Ташкентского государственного университета Узбекиского языка и литературы имени Алишера Навои (зарегистрирован под номером 28). Адрес: 100100, Ташкент, Яхшасариевский район, улица Юсуфа Хас Хаджиба, 103. Тел.: (09871) 281-42-44; факс: (09871) 281-42-44, (www.uzuni.uz), электронная почта: prokoting@uzuni.uz

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Президент Научного совета
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ВВЕДЕНИЕ (анинганя диссертация доктори философии (PhD))

Актуальность и необходимость темы диссертации. В мире научные направления, связанные с применением информационных технологий в языкознании, стали развиваться с 40-х годов XX века. В результате этого были созданы такие научные направления, как компьютерная лингвистика, корпусная лингвистика, машинный перевод. Возникла необходимость разработки формальной грамматики систем анализа этих направлений. К 50-м годам XX века были разработаны и начали использоваться системы автоматического морфологического анализа в областях обработки естественного языка и машинного перевода. Определение отношения речи ко времени важно в процессе морфологического анализа.

Известно, что пространство и время являются фундаментальной формой существования, и любая информация, действие, ситуация имеет признаки времени и пространства. Понимание связи информации со временем является важным условием понимания изменений в мире. Время определяет время возникновения тех или иных событий и ситуаций, а значит, их последовательность в памяти, а также то, как долго они длились. Необходимость обеспечения автоматического выполнения аналитических операций информации во времени побуждает практическую значимость вопроса инкорпорации грамматических форм времени.

В мировом языкознании в конце XX века одним из актуальных вопросов стало создание языковых корпусов и их лингвистическая винтизация. Это послужило импульсом для создания программной и лингвистической поддержки тегирования слов и грамматических форм для каждого языка. В результате к началу XXI века были созданы языковые корпусы, содержащие миллионы слов. Большинство из них имеют возможность анализировать к какому времени относится информация в корпусе по грамматическим формам представляющим время и временные выражения. На сегодняшний день одной из важнейших задач языковой корпусной лингвистики является определение таких корпусов, как передача времен глагола, относится он это к другому времени по контексту в автоматическом анализе.

В узбекской лингвистике исследования по компьютерной лингвистике стали проводиться с начала XX века. Ранние исследования связаны с лингвистическими и лексикографическими исследованиями узбекского языка на основе достижений мировой компьютерной лингвистики, в последние годы особое внимание уделяется вопросам создания национальных и отраслевых корпусов узбекского языка, разработке программ морфологического, семантического анализаторов. Особое внимание уделялось работе в этой области после того, как были поставлены задачи по обеспечению активной интеграции государственного языка в информационные технологии¹ и коммуникации и созданию Национального корпуса узбекского языка в

¹ Указ № 141-604 Президенту Республики Узбекистан Шавката Мирзиёева от 20 октября 2020 года «О мерах по дальнейшему развитию узбекского языка и совершенствованию языковой политики» (<http://lex.uz/docs/32550>)

электронном виде, содержащего всю научную, теоретическую и практическую информацию касающуюся узбекского языка. Однако преобразование лингвистических данных, собранных в результате более чем полувекового исследования, в лингвистический ресурс для языкового корпуса не является задачей, которую можно охватить в рамках неограниченных исследований, проведенных до сих пор. Ни один инструмент в мире не может сравниться с компьютерами в способности обрабатывать данные для конкретной цели и быстро применять их к различным аспектам человеческой деятельности⁴². Учитывая практическую значимость и богатые возможности прекрасно аннотированных языковых корпусов, используемых сегодня в мире, существует необходимость проведения исследований по лингвистической аннотации каждой категории узбекского языка, исходя из их уникальности, для создания такого корпуса и в нашем национальном языке. Следует отметить, что все грамматические формы, обозначающие время, не полностью лингвистически аннотированы в создаваемых на практике корпусах узбекского языка. Также актуальность темы определяет тот факт, что вопрос аннотирования грамматических форм, выражающих время для корпуса узбекского языка, до сих пор не исследовался в монографическом плане.

Цель исследования. Целью исследования является обоснование моделирования и аннотирования грамматических форм, представляющих время в языке для корпуса узбекского языка.

Объект исследования. Объектом исследования являются грамматические формы, выражающие время в узбекском языке. В этом случае анализ грамматических форм времени проводится на основе текстов Учебного корпуса узбекского языка (uzschoolcorp.us).

Научная новизна исследования:

определены отличительные от других особенности выражающих время грамматических форм узбекского языка, такие как примесное наблюдение или косвенное संबोधение, характерное для статических или динамических действий-ситуаций, акцент на подлежащем, косвенная связь с моментом речи; выделены грамматический, семантический и контекстуальный уровни временной аннотации, выявлено влияние лексического значения глагола на уровень временной аннотации;

выявлены причины различного употребления временных форм в языковых ситуациях и уровни активности в речи, такие как их встречаемость в устной или письменной речи, их историчность, характеристика для художественного стиля;

доказаны способы решения проблем с омонимичными и многозначными грамматическими формами на основе морфотаксических правил, которые приводят к ошибке в программе, возникающей в процессе аннотирования форм времени.

⁴² Гейнорн А., Абдурашимова Н. Корпус фразеологизмов узбекского языка. Ташкент: «Тарбия» издательство, 2019. – 53–58. URL: www.uzschoolcorp.us

Выводы результатов исследований. Из выводов о морфотаксических проблемах решения проблем, вызывающих ошибки в программе, связанных с омонимичными и многозначными грамматическими формами, возникающими в процессе аннотирования временных форм, о влиянии лексического значения глагола на восприятие продолжительных временных суффиксов исползованы в практическом грантовом проекте «Создание образовательного корпуса узбекского языка» под номером AM-FZ-201908172, выполненном в 2020–2022 годах в Ташкентском государственном университете узбекского языка и литературы имени Алишера Навои (Справка номер 01-3230 Ташкентского государственного университета узбекского языка и литературы имени Алишера Навои от 24 ноября 2022 года). В результате было разработано лингвистическое обеспечение аннотирования временных форм в корпусном тексте.

Из выводов об особенностях грамматических форм выражения времени в узбекском языке, отличающихся от других, таких как примесное наблюдение или косвенное संबोधение, характерное для статических или динамических действий-обстоятельств, описание субъекта, косвенная связь, с моментом речи было исползовано в практическом грантовом проекте «Создание электронной платформы, развивающей устные и письменные речевые компетенции учащихся начальных классов общего среднего образования» под номером PZ-202004165, выполненном в 2020–2023 годах в Ташкентском государственном университете узбекского языка и литературы имени Алишера Навои (Справка номер 01-3229 Ташкентского государственного университета узбекского языка и литературы имени Алишера Навои от 24 ноября, 2022 года). В результате платформа наполняется информацией об употреблении времен и различных речевых ситуациях.

Научные данные о встречаемости в устной или письменной речи различной степени речевой активности форм времени, характерной для художественного стиля были исползованы при подготовке номера радиосеанса, транслируемого по радио «Узбекистан» Национальной телерадиокомпанией Узбекистана, посвященного 21 октября – дню продолжения узбекского языка (Справка номер 04-32-1127 Национальной телерадиокомпанией Узбекистана радиосеанса «Узбекистан» от 15 ноября 2022 года). В результате содержание той передачи обогащается научными доказательствами.

Структура и объем диссертации. Диссертация состоит из введения, трех основных глав, заключения, списка исползованной литературы и приложения. Общий объем диссертации 159 страниц.

E'OLON QILJINGAN ILMİY ISHLAR RO'YXATI
LIST OF PUBLISHED WORKS
СПИСОК ОПУБЛИКОВАННЫХ РАБОТ

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