



The use of computer technology in the projecting of the design object

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ABSTRACT

This article discusses various aspects of using Autodesk software when designing various design objects. The possibilities of automated design systems and software for three-dimensional modeling and visualization are analyzed.

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Dizayn obyektini loyihalashda kompyuter texnologiyalaridan foydalanish

ANNOTATSIYA

Kalit so'zlar:

3D modellashtirish,
uch o'lchamli grafika,
CAD,
AutoCad,
3d Max,
vizualizatsiya.

Ushbu maqolada dizayn obyektini loyihalashda Autodesk dasturlarini qo'llashning turli yo'nalishlari ko'rib chiqiladi va avtomatlashtirilgan loyihalashtirish tizimlari, uch o'lchovli modellashtirish va vizualizatsiya qilish dasturlarining imkoniyatlarini tahlil qiladi.

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Использование компьютерных технологий при проектировании объекта дизайна

АННОТАЦИЯ

Ключевые слова:

3D моделирование,
трехмерная графика,
САПР,
AutoCad,
3d Max,
визуализация.

В этой статье обсуждаются различные аспекты использования программного обеспечения Autodesk при проектировании различных объектов дизайна. Анализируются возможности автоматизированных систем проектирования и программного обеспечения для трехмерного моделирования и визуализации.

Bugungi kunda kompyuterda modellashtirish va 3D-vizualizatsiya jamiyat hayotida muhim rol o'ynaydi. Biz uni deyarli har kuni uchramiz: uch o'lchamli grafikalar yordamida loyiha ishlari, eksteryer va interyer dizayni, reklamalar, kompyuter o'yinlari, filmlar va multfilmlar... Ushbu ro'yxat juda uzoq vaqt davom etishi mumkin.

Hozirda arxitektura va qurilish, dizayn sohasini zamonaviy kompyuter model-lashtirish dasturlarida yaratilgan uch o'lchovli sahnalar, interaktiv renderlar va animatsiyalar, realistik vizualizatsiyalarsiz tasavvur qilish qiyin. Innovatsion texnologiyalarga asoslangan kompyuter grafikasi dasturlari va texnik vositalarining yangi avlodi an'anaviy loyihalash, modellashtirish va taqdimotlar usullaridan kompyuter yordamida avtomatlashtirilgan loyihalash (ALT), 3d modellashtirish va skulpting, vizualizatsiya (render), informatsion modellashtirish (BIM) tizimlaridan foydalanishga keng imkoniyatlar ochib berdi [1].

Dizayn obyektini kompyuterda loyihalash obyektning geometrik modelini, vizual grafik tasvir – ikki yoki uch o'lchamli tasvir shaklida modellashtirishga asoslangan.

Kompyuter grafikasi va kompyuter yordamida loyihalash (ALT) tizimlari har qanday zamonaviy dizayner kasbiy faoliyati uchun eng muhim va zarur tarkibiy komponent hisoblanadi.

Yurtimizda ko'plab oliy va o'rta ta'lim muassasalari, shuningdek turli xil o'quv markazlari loyiha ishlarini kompyuterda modellashtirish va vizualizatsiya dasturlari bo'yicha o'qitishni taklif qilmoqda. Kompyuter texnologiyalariga bunday qiziqishning sababi nimada? Ehtimol, ma'lumotni taqdim etishning aniqligi va tushunarligida, uning fotorealizmida, shuningdek dizaynning istalgan bosqichida osongina tahrirlash imkoniyatlarining mavjudligidadir.

Kompyuter yordamida avtomatlashtirilgan loyihalash tizimlari yordamida interyer va eksteryer ko'rinishlari, jihozlar, kichik me'moriy shakllar, sanoat buyumlari, ya'ni atrofimizni o'rab turgan barcha elementlarni va muhitni to'liq hajmli uch o'lchovli modellarda loyihalashtirish mumkin, va ular barcha kerakli ish hujjatlarini va chizmalarini olishga imkon beradi.

Kompyuter texnologiyalari imkoniyatlaridan foydalanmaydigan qurilish kompaniyasi, arxitektura yoki dizayn kompaniyasini topish juda qiyin bo'lib, interyer va eksteryer vizualizatsiyasi kompyuter grafikasi bozorining muhim segmentini egallab kelmoqda. Qurilish boshlanishidan oldin ham bo'lajak uyni barcha detallari bilan ko'rish-fotorealistik vizualizatsiya amalda soha standartiga aylandi.

Kompyuter texnologiyalari yordamida loyihalash jarayoni ijodiy qidiruvni osonlashtirishi va sezilarli darajada g'oyani amalda qanday ko'rinishini modellashtirish orqali, uni tasavvur qilishga imkon beradi. Kompyuter texnologiyalaridan erkin foydalana

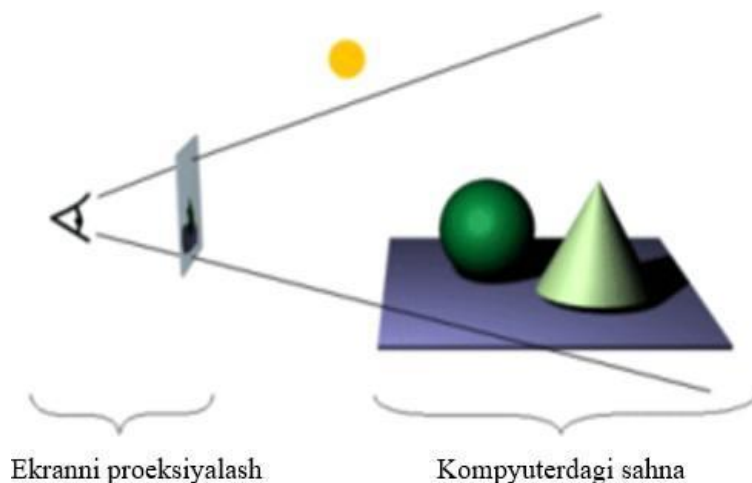
olish, dizaynerning tasavvurini yangi g'oyalarni faol ravishda ishlab chiqarishga, shuningdek, murakkab jarayonlar va vaziyatlarni modellashtirishga imkon beradi [2-5]. Misol uchun, so'nggi yillarda juda mashhur bo'lgan yorug'lik dizayni faqat uch o'lchamli kompyuter simulyatsiyasi dasturlari yordamida ishonchli tarzda ifodalanishi mumkin. Quyida eng zamonaviy sohada talab yuqori bo'lgan va dizaynerlar tomonidan tavsiya etilgan dasturiy ta'minotlar bilan tanishamiz.

Autodesk 3DS Max – Autodesk tomonidan ishlab chiqilgan 3D modellashtirish va animatsiyalarni yaratish va tahrirlash uchun professional dasturiy ta'minot tizimi. Dasturda dizaynerlar va arxitektorlar uchun eng zamonaviy uskunalar mavjud. Hozirgi vaqtda dastur o'zining keng funksionalligi va vositalarning imkoniyatlari tufayli dizayn sohasida eng ommaboplaridan biri hisoblanadi. Shuning uchun dizayn bo'yicha mutaxassislarni tayyorlaydigan aksariyat ta'lim muassasalarida 3DS Max dasturi o'quv dasturiga kiritilgan.

“3D modellashtirish” – uch o'lchamli obyekt modelini yaratish jarayonidir. “D” prefiksi inglizcha, “dimensional”- o'lcham ma'nosini anglatadi. Uch o'lchamli model-lashtirishning vazifasi kerakli obyektning vizual hajmli ko'rinishini yaratishdan iborat.

“Uch o'lchamli grafika” – uch o'lchovli fazoda hajmli obyektlarni modellashtirish orqali tasvir yoki video yaratish usullariga bag'ishlangan kompyuter grafikasi bo'limi.

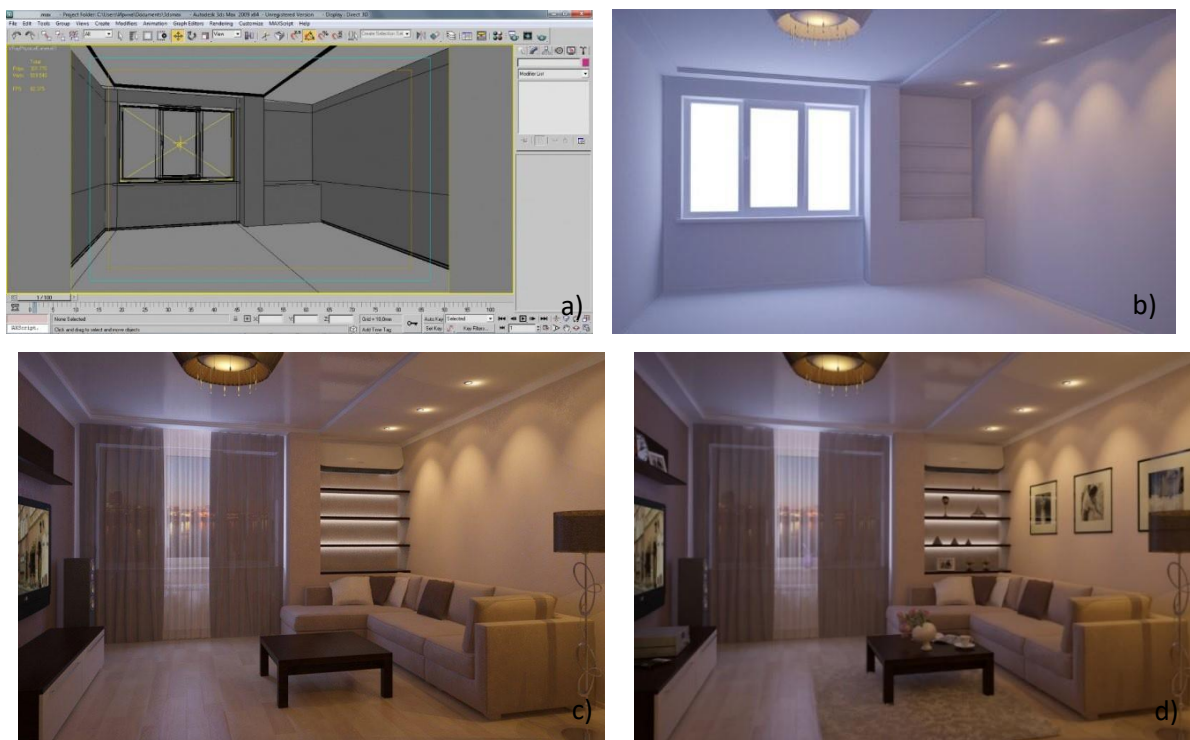
Uch o'lchamli grafikalar yordamida muayyan obyektning aniq nusxasini yaratish va hali mavjud bo'lmagan obyektning yangi, hatto real bo'lmagan yechimlarini ishlab chiqish mumkin. Ilmiy va ishlab chiqarish sohalarida, masalan, dizayn ishlarini avtomatlashtirish, arxitektura vizualizatsiyasi tizimlarida ekran yoki bosma mahsulot ko'rinishida tasvirlarni yaratish uchun faol ishlatiladi.



1-rasm. Uch o'lchamli tasvir yaratish.

- Uch o'lchamli tasvirni olish uchun quyidagi amallarni bajarish kerak:
- Modellashtirish – sahna va obyektlarning uch o'lchamli matematik modelini yaratish (2-rasm, a);
- yoritish-yorug'lik manbalarini o'rnatish va sozlash (2-rasm, b);
- teksturalash-rastr yoki materiallar teksturasini modellarning sirtlariga tayinlash (shuningdek, materiallarning xususiyatlarini – shaffoflik, aks ettirish, g'adir-budurlik va hokazo.) (2-rasm, c);
- animatsiya (ba'zi hollarda) – obyektlarga harakatni berish;

- dinamik simulyatsiya (ba'zi hollarda) – zarralar, shamol, surish va hk, shuningdek bir-biri bilan taqqoslanadigan tortishish kuchlari bilan zarralar, qattiq va yumshoq jismlar va boshqalarning o'zaro ta'sirini avtomatik ravishda hisoblash;
- render – (vizualizatsiya) – tanlangan jismoniy modelga muvofiq proeksiyani yaratish (2-rasm, d);
- kompozitsiya – (komponovka) – tasvirni takomillashtirish;
- olingan tasvirni chiqish qurilmasiga chiqarish-display yoki maxsus printer.

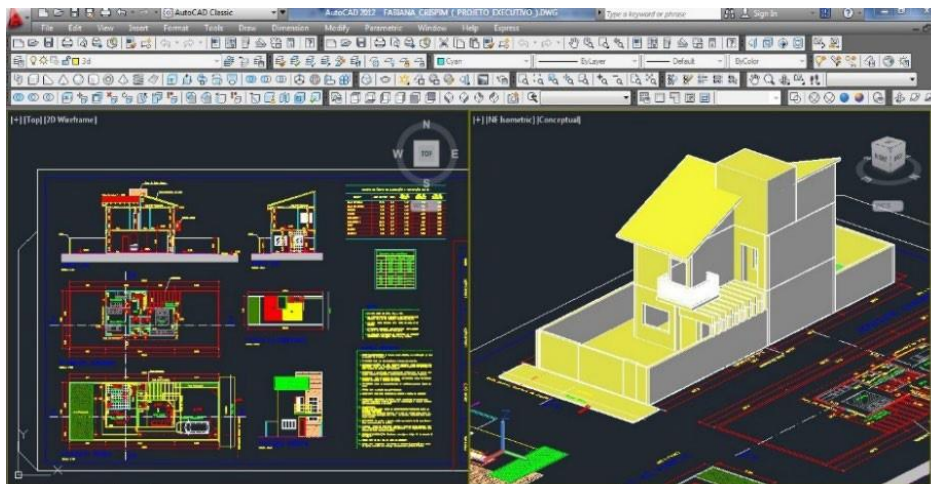


2-rasm. Uch o'lchamli tasvir olish bosqichlari.

a) Modellash; b) Yoritish; c) Material berish; d) Renderlash.

AutoCAD – Autodesk tomonidan ishlab chiqilgan kompyuterda avtomatlashtirilgan ikki va uch o'lchamli loyihalash tizimidir. Avtomatlashtirilgan loyihalashtirish tizimlari dizaynning professional faoliyatining ajralmas qismi hisoblanadi. Ushbu axborot tizimlari dizaynning o'ziga xos badiiy-dizayn va dizayn-texnologik muammolarni hal qilishda qo'llaniladi.

AutoCAD (inglizcha qisqartirilgan, “Automated Computer Aided Drafting and Design”, komyuter yordamida avtomatlashtirilgan chizmachilik va loyihalashni bildiradi) dasturi 1982-yilda Amerikaning grafika sohasida dunyodagi yetakchi dasturlar yaratuvchisi Autodesk kompaniyasi tomonidan ishlab chiqilgan va har qanday murakkablikdagi chizmalar, texnik hujjatlarni yaratishga imkon beradigan avtomatlashtirilgan loyihalashtirish tizimi(CAD) hisoblanadi (3-rasm).



3-rasm. Autocad dasturida bajarilgan loyiha.

AutoCAD foydalanuvchi va dastur o'rtasida dialogli rejimda aloqa o'rnatgan holda, obyektlarning ikki o'lchovli chizma va uch o'lchovli modellarini yaratadi.

CAD – dasturlari (computer aided design (kompyuter yordamida loyihalash) – loyihalash va texnik hujjatlarni ishlab chiqish uchun tizimli kompleks dasturlar (4-rasm) bo'lib, qo'lda chizishni avtomatlashtirilgan jarayon bilan almashtiradi.

Ushbu keng qo'llaniladigan dasturlar qurilish hujjatlarini tayyorlashda, dizayn g'oyalarini o'rganishda, loyihani kompyuter muhitida uch o'lchamli modellashtirishga yordam beradi.



4-rasm. Turli kompaniyalarning CAD dasturlari.

O'zbek tilida qisqartirishda ALT – Avtomatlashtirilgan loyihalash tizimlari, rus tilidagi qisqartirishda – SAPR (система автоматизированного проектирования) deb yuritiladi.

Barcha CAD tizimlari, terminologiyadan qat'iy nazar, loyihalash va muhandislik ishlarini optimallashtirish uchun mo'ljallangan bo'lib, agar to'g'ri qo'llanilsa, tegishli ravishda ish mahsulдорligini oshiradi va kengaytirilgan grafik imkoniyatlarini beradi.

Yuqorida keltirilgan misollardan xulosa qilish mumkin-ki, axborot texnologiyalari vositalaridan foydalangan holda, dizaynerlar maxsus dasturiy ta'minotdan foydalanib, loyihani tez va aniq tayyorlashlari, loyihaga har qanday tahrirlarni tezda kiritishlari, kerakli texnik va loyiha hujjatlarini tayyorlashlari, shuningdek, o'z loyihalarini nashr etishlari va loyihani mijoz va keng jamoatchilik oldida taqdim etishlari mumkin bo'ladi.

Konseptual, funksional va texnik muammolarni hal qilishda yordam beradigan kompyuter texnologiyalari dizayner ijodida muhim o'rin egallab, dizayn g'oyasining hissiy ta'sirini kuchaytiradi va loyihaning muvaffaqiyatiga hissa qo'shadi.

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