**What is computer graphics?**

Computer graphics refers to a technology that generates images on a computer screen. It’s used in digital photography, film and television, video games, and on electronic devices and is responsible for displaying images effectively to users. Think of computer graphics as the intersection of design and computer science, with the purpose of delighting and engaging audiences.

You can find examples of computer graphics in action all around you. Some examples include blockbuster films, such as the 2009 film *Avatar*, which depicts the Na’vi species using facial motion capture technologies, images and icons you see on your smartphone when you open mobile applications, and data presentations like charts and graphs you might come across in your line of work.

**Types of computer graphics**

**Raster graphics**

A raster graphic is essentially a 2D image composed of rows and columns of square pixels. Each pixel contains information about color and hue. When combined, pixels form a coherent image. The more pixels per inch the more high-resolution an image. A high-resolution raster graphic will appear sharper and more true-to-life than one with low resolution.

**Vector graphics**

A vector graphic is made up of shapes and lines. Mathematical formulas determine how the shapes and lines relate to each other, so that you can scale vector graphics larger or smaller in size without distorting the shape or resolution.

CGI, or computer-generated imagery, turns 2D vector graphics into 3D representations and converts them into raster images. CGI is used in TV, film, or video games to depict characters, scenes, and special effects.

### Interactive computer graphics

Interactive computer graphics allow a user to tell a computer how to generate an image. Here’s a sampling of what you can do in interactive computer graphics:

* Add automatic zooming on an interactive scrolling interface to improve scan of a 2D information space.
* Add automatic adjustments to digital sketch programs to easily record ideas in 2D using digital ink.
* Add a dragging feature to clothing animations to improve the experience of adding clothes to 3D characters.
* Use motion files from a 3D animation database to generate moving characters from stick figure drawings.
* Design indoor lighting using a painting interface to control a robotic lighting system.

Explore graphic design fundamentals including computer graphics in [CalArts's Fundamentals of Graphic Design](https://www.coursera.org/learn/fundamentals-of-graphic-design" \t "_self).

### Non-interactive computer graphics

In contrast to interactive computer graphics, non-interactive computer graphics do not allow users to determine how images are generated. Examples of non-interactive computer graphics include images for a website or mobile application and 3D animation and CGI in film.

## Computer graphics software

Using computer graphics software can bring a world of possibilities within reach and allow you to explore your creative and technical potential. In the table below, we cover the cost and features of five software programs, as well as how users rate each program on G2, a site for discovering and reviewing software. G2 ratings for these software programs reflect users’ perceptions of the ease of use and quality of support [[2](https://www.g2.com/compare)].

A screenshot of a computer

Description automatically generated

## Computer graphics jobs

If you’re thinking about pursuing a career in computer graphics, it’s helpful to know what kinds of jobs may be available to you. Below, we list some job titles you may come across in your research and include average total US salary figures from Glassdoor as of January 2023, and responsibilities and typical job requirements from Zippia and ZipRecruiter.

Use this list as a basis for further research and choosing the path that aligns with your long-term goals.

### Computer graphics designer

* **What they make:** $59,518
* **What they do:**design graphics for interactive websites; create visuals for print or digital use; use graphics software to satisfy stakeholders’ needs
* **Qualifications they need:** knowledge of graphics software; graphic design and computer graphics skills; associate or bachelor’s degree in graphic design, computer science, or computer applications

### Digital artist

* **What they make:** $54,344
* **What they do:**use computer software to create digital art and design graphic images; work with illustrations, photography, and text
* **Qualifications they need:**bachelor’s degree in visual or commercial art, graphic design, or related field; knowledge of graphics software; artistic talent

### Web developer

* **What they make:** $82,534
* **What they do:**design and maintain websites; test out new code; test web modules; optimize user-interface designs; provide technical support to project stakeholders
* **Qualifications they need:**bachelor’s or master’s degree in computer science, IT, or computer engineering; knowledge of JavaScript, HTML, and CSS; UX/UI skills; front-end development skills

### Animator

* **What they make:** $58,059
* **What they do:**sketch scenes; create storyboards; animate characters, props, and scenery; collaborate with other creatives to animate films and games
* **Qualifications they need:**skills in animation, motion capture, storyboards, motion graphics; experience using animation software; associate or bachelor’s degree in animation, graphic design, fine arts, or computer science

### Game artist

* **What they make:**$59,935
* **What they do:** create art and visual elements for video games; use software to build characters, objects, textures, clothing, etc.; collaborate with teams and stakeholders to complete projects
* **Qualifications they need:** associate or bachelor’s degree in graphic design, animation, or fine arts; skills in animation and sketching; skills using Maya; UI skills

### Graphic engineer

**What they make:**$82,204

**What they do:**create integrated graphics and visual effects systems for software applications; collaborate with artists and graphic designers to create motion graphics and visuals

**Qualifications they need:**skills in [C++](https://www.coursera.org/articles/what-is-c-plus-plus), OpenGL, Unity, and other technologies; animation skills; associate’s or bachelor’s degree in graphic design, computer science, or drafting and design

## How to get started in computer graphics

Once you’re ready to start your computer graphics journey, follow the process below to streamline your efforts.

### 1. Get a computer graphics education.

Identify the [career path](https://www.coursera.org/articles/career-path) you want to follow, projects you want to complete, and the skills, education, and qualifications you’ll need. Jobs in computer graphics often require a bachelor’s degree in design, computer science, or a related field. If you already have a degree, you may be able to build necessary skills by taking courses or getting a certification in a specific area of computer graphics. For example, to become a web designer, you’ll need to learn various programming languages and how to design user experiences and interfaces on the [front end](https://www.coursera.org/professional-certificates/meta-front-end-developer).

**Read more:**[Bachelor’s Degree in Computer Science: A Guide](https://www.coursera.org/articles/computer-science-bachelor-degree)

### 2. Experience graphics software for yourself.

As you build skills inside the courses you’re taking, you’ll want to gain exposure to different graphics software programs. That way you can apply your new skills, launch new projects, and choose the best one for you. Use the table above to guide your software research. Vet software programs according to their cost, features, ease of use, job requirements, and relevance to your goals.

### 3. Complete computer graphics projects.

Completing projects in computer graphics can be a great way to apply your new skills, refine your long-term [goals](https://www.coursera.org/articles/career-goals), explore your potential, and bring ideas to life. You may find it helpful to complete projects that span different areas of computer graphics, from designing and developing websites to animating characters for film or gaming.

### 4. Create a portfolio of your work.

As you complete computer graphics projects, add them to an online portfolio or website that you can use when applying for jobs, taking on contract work, or networking with others in this field. Be sure the portfolio displays the visual aspects of your work, your skills, and how your work is used. Consider sharing your portfolio on social media and [resume](https://www.coursera.org/articles/how-to-make-a-resume), and even creating a profile on talent sites such as Upwork or Fiverr.

**Read more:**[How to Use LinkedIn: A Guide to Online Networking](https://www.coursera.org/articles/how-to-use-linkedin)

### 5. Apply for jobs in computer graphics.

If your long-term goal is to pursue a career in computer graphics and advance in this field, it’s a good idea to gain some experience. Look for entry-level positions, freelance and contract work, and internships. In your search for employment, examine each job description carefully to find out the projects and tasks you’ll be completing, the qualifications required, and details about the company.

Use these resources to enhance your job search:

* [11 Interviewing Skills to Benefit Your Career](https://www.coursera.org/articles/interviewing-skills)
* [30 Career-Focused Questions to Ask in an Interview](https://www.coursera.org/articles/questions-to-ask-in-an-interview)
* [How to Negotiate Your Salary: 10 Tips to Earn More](https://www.coursera.org/articles/how-to-negotiate-salary)

## Get job-ready skills with Coursera

Sign up for professional certificate programs from industry leaders Google and Meta to build skills like wireframing, using Adobe software tools, designing user experiences, and using programming languages.