VISUALIZING THE FUTURE

Demand for 3D graphics and real-time 3D across the economy

Epic Games and Burning Glass Technologies

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Advanced 3D technology has demonstrated the potential of the virtual world—real-time 3D is expanding horizons. Labor market demand for workers proficient in these fields is robust and growing.

Advanced 3D technology has demonstrated the potential of the virtual world. 3D graphics have become essential to understanding designs and concepts in industries as diverse as architecture, manufacturing, health care, and film. Due to the constraints of prior technology, much of this visualization has historically been focused on static images or limited animations. In the last few years, however, the explosion of virtual reality technology has shifted the paradigm from observation to experience. Earlier 3D graphic technologies fell short of delivering experiences that allow for exploration and interaction, but the growing field of “real-time 3D” enables these possibilities. Real-time 3D skills and technologies have risen in importance as companies seek to achieve immersive experiences. Real-time 3D extends the horizon of 3D graphics to realize the full potential of the virtual world, to bridge the gap between being on the outside looking in and being on the inside looking around.

To be considered real-time, the interaction between a user and a virtual scene must register faster than a blink of an eye. This feat is achieved through real-time rendering. Many real-time 3D applications are already familiar: flight simulator pilot training, video games, virtual reality headsets, or actors in motion capture suits using their performance to drive animated characters in a live environment.

Labor market demand for 3D graphics skills is spreading across the broader economy. Real-time 3D is a subset of 3D graphics with particularly explosive demand growth. 3D graphics and real-time 3D skills are emerging as a force for innovation in fields like engineering, IT, and design. Increasing demand for these skills in business fields such as sales and marketing demonstrates the desire to commercialize the associated products. As consumer appetite for immersive experiences increases, demand for real-time 3D will continue to spread across the workforce.

Epic Games partnered with Burning Glass Technologies to quantify demand for these skills and to investigate factors impacting the use and adoption of 3D graphics and real-time 3D skills in the workforce.

This is a condensed version of the resulting full report, Visualizing the Future: Demand for 3D Graphics and Real-time 3D Across the Economy, which you can read at www.burning-glass.com/research-project/visualizing_future_3d_skills_workforce.
The analysis, which was based on data collected in the USA, yielded the following key conclusions:

**Demand for 3D graphics is robust, and demand for real-time 3D skills is growing quickly.** Between October 2017 and October 2018, more than 315,000 job postings requested 3D graphics skills, with a growth rate 42% faster than the market overall. Demand for real-time 3D skills, which are at the technological frontier of 3D graphics, has grown 601% faster than the market overall and now accounts for 10% of all openings calling for 3D graphics, up from 4% in 2013. In total there were 31,339 openings calling for real-time 3D skills between October 2017 and October 2018.

**Proficiency with 3D graphics is a foundational skill for engineers.** Engineering accounts for 48% of the demand for 3D graphics, and 96% of these job openings request CAD skills. CAD technology is beginning to employ real-time 3D as well, with over 2,000 job postings requesting proficiency with at least one real-time CAD technique or technology.

**3D graphics skills have different use cases in different career fields.** In engineering, 3D graphics skills are important for industrial and boutique manufacturing. In information technology and design and media, 3D graphics and real-time 3D are used to create immersive experiences. In these career areas, animation skills, proficiency with game engines, and manipulation of virtual reality (VR) are in high demand.

**Real-time 3D skills are undersupplied, and that is unlikely to change any time soon.** Real-time 3D is associated with a large salary premium: 57% above the average advertised salary and 18% above the average advertised salary for jobs requesting 3D graphics skills in general. In the career fields where these skills are in highest demand, filling a position can often take over 40 days. Real-time 3D skills are also among the fastest-growing in the market, which carries the risk of exacerbating the gap between supply and demand.

**Mastering 3D graphics or real-time 3D skills can lead to strong entry-level opportunities and provide a boost to early-career professionals.** Nearly a quarter (23%) of job openings calling for 3D graphics skills and a fifth (19%) for real-time 3D skills are entry-level positions, and these carry a salary premium of 24% and 45% respectively above other entry-level jobs. Becoming proficient with these skills can also benefit early-career professionals—most job openings calling for 3D graphics skills require 3-5 years of experience; on average, these postings advertise a salary 13% higher than other job postings requiring similar levels of experience—and 38% higher for jobs requesting real-time 3D skills.

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### LABOR MARKET DEMAND

<table>
<thead>
<tr>
<th>3D GRAPHICS SKILLS</th>
<th>Real-Time 3D SKILLS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Over 315,000</strong> job postings between October 2017 and October 2018</td>
<td><strong>Over 30,000</strong> job postings between October 2017 and October 2018</td>
</tr>
</tbody>
</table>

### DEMAND GROWTH

<table>
<thead>
<tr>
<th>3D GRAPHICS SKILLS</th>
<th>Real-Time 3D SKILLS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>42%</strong> faster than the market overall</td>
<td><strong>601%</strong> faster than the market overall</td>
</tr>
</tbody>
</table>

### SALARY PREMIUM

<table>
<thead>
<tr>
<th>3D GRAPHICS SKILLS</th>
<th>Real-Time 3D SKILLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average starting salary of <strong>$73,513</strong></td>
<td>Average starting salary of <strong>$86,533</strong></td>
</tr>
<tr>
<td>34% above average advertised salary</td>
<td>57% above the average advertised salary and 18% above the average advertised salary for jobs requesting 3D graphics skills in general</td>
</tr>
</tbody>
</table>
2. Introduction

The difference between the real world and the virtual world is narrowing. As the generation brought up with video games, smartphones, and the internet enters the workforce and as companies explore the opportunities unlocked by advanced visual technology, the growing importance of the virtual world is also reflected in the labor market.

The initial capabilities of 3D graphics hinted at the possibilities of the virtual world. Being able to visualize 3D data made architectural blueprints come alive and brought previously impossible scenes to the silver screen. It aided prosthetists in rebuilding the human body. And it revolutionized how brands, companies, and industries present themselves and their products. Visualization using pre-rendered images alone, however, falls short of delivering the genuine experiences promised by the virtual world. Missing from such pre-rendered representations is the real-time interaction that makes an experience truly immersive. Real-time 3D, then, aims to extend the horizon of 3D graphics and realize the full potential of the virtual world.

Real-time 3D applies real-time rendering to 3D data. To be considered real-time, the interaction between a user and a virtual scene must register much faster than the blink of an eye—films are shot at 24 frames per second, but real-time 3D technologies aim for 90 frames per second. Slower than this rate, a user will judge the experience as non-interactive. Real-time 3D also enjoys many degrees of freedom and a wide range of interaction. Instead of watching a clip taken from a plane’s cockpit, real-time 3D brings a trainee pilot inside the plane, where they can not only look around at the scenery, but also engage with the scene—steer the plane, adjust its flight controls, succeed or fail in landing it depending on their actions.

Real-time 3D is updating the ways in which individuals interact with designs and concepts, and its applications are already widespread. Pilots take advantage of real-time 3D when they train on flight simulators. Real-time 3D allows architects and designers to walk clients through a building that has yet to be constructed. Production facilities use real-time 3D to follow the workflow between workers and machines. Actors in motion capture suits simulating the movements of animated characters are relying on real-time 3D. Real-time 3D is an important facet of the modern economy, and its importance is only set to grow.
Demand for real-time 3D skills, which are at the technological frontier of 3D graphics, has grown faster than the market overall. It now accounts for 60% of all openings calling for 3D graphics, up from 4% in 2013. In total, there were 31,339 openings calling for real-time 3D skills between October 2017 and October 2018.
3. Methodology

To analyze demand for 3D graphics skills and real-time 3D in the workforce, Epic and Burning Glass took a two-stage approach, first defining the full universe of 3D graphics skills and then identifying which of those skills leverage real-time techniques. Burning Glass and Epic identified 209 skills related to 3D graphics and 97 skills as relevant to real-time 3D. The basket of real-time 3D skills was then compared to the larger universe of 3D graphics skills to identify where these skills are emerging and where they are adding value.

To assess demand for 3D graphics and real-time 3D skills, Burning Glass mined its comprehensive database of nearly a billion current and historical online job postings in the USA to identify occurrences of these skills in job openings, applying detailed text analytics to code the specific jobs, skills, and credentials requested by employers.

For complete details of the methodology used, refer to the full report at www.burning-glass.com/research-project/visualizing_future_3d_skills_workforce.
Stage 1: Examples of 3D graphics skills by category

- **CAD**
  - AutoCAD
  - SolidWorks
  - Microstation
  - Civil 3D
  - SketchUp

- **Entertainment**
  - Maya
  - 3ds Max
  - Cinema 4D

- **Rendering**
  - V-Ray
  - Luxion Keyshot
  - Act-3D Lumion
  - Substance Painter
  - Pixar RenderMan

- **VR & AR**
  - Oculus
  - Windows Mixed Reality
  - Vuforia
  - Magic Leap
  - HoloLens
  - HTC Vive

- **Web 3D**
  - D3.js
  - Three.js
  - BabylonJS

- **Game & Visual Engines**
  - Unreal Engine
  - Unity
  - CryEngine
  - OpenSpace

- **General Skills**
  - 3D Modeling
  - 3D Graphics
  - 3D Animation
  - Game Engines
  - 3D Rendering

- **Motion & Reality Capture**
  - Photogrammetry
  - MotionBuilder
  - Matterport
  - Vicon

- **Miscellaneous**
  - Media: VizRT
  - 3D Sculpting: Mudbox
  - ... and more

Stage 2: Examples of real-time 3D skills

- Virtual reality (VR)
- Navisworks
- Unreal Engine
- Augmented reality (AR)
- Oculus Rift
- Mixed reality

- Unity
- Magic Leap
- Siemens Lifecycle
- Luxion KeyShot
- HoloLens
- Flight Simulation

- Act-3D Lumion
- Three.js
- ARKit
- Dassault Systèmes 3DExperience
- VizRT

- HTC Vive
- ARCore
- MotionBuilder
- ... and more
4. Findings

Demand for 3D graphics is robust, and demand for real-time 3D is growing quickly.

Between October 2017 and October 2018, there were 315,246 job openings requesting 3D graphics skills. The demand for 3D graphics skills is over 55,000 openings greater than demand for data science-related skills.\(^1\) As robust as workforce demand already is for 3D graphics, it only continues to climb: since 2013, demand for 3D graphics skills has grown 42% faster than the market overall.

Of the job openings requesting 3D graphics skills, 31,339—or 10%—specifically requested real-time 3D skills. Demand for real-time 3D skills has grown 601% faster than the market overall. The demand for real-time 3D resembles demand for other advanced, fast-growing clusters of skills, such as those related to natural-language processing, digital design, or neuroscience. There were between 25,000 and 35,000 job postings over the same time period calling for skills from each of these clusters.

Real-time 3D has emerged as a skill cluster with meaningful demand.

Growth in demand for real-time 3D has outpaced the rapid growth in demand for 3D graphics skills as a whole. Demand for real-time 3D has grown nearly five times faster than demand for 3D graphics skills and over seven times faster than the market overall. Within jobs calling for 3D graphics skills, real-time 3D skills are now requested 2.4 times more often than in 2013.

CAD in real time

CAD technologies are evolving to incorporate real-time technology. SketchUp, a popular CAD software, has a plethora of extensions that take advantage of real-time rendering. Autodesk software such as Navisworks and Revit is incorporating real-time rendering to create photorealistic images and to allow users to manipulate designs through different lightings and atmospherics. Given that real-time capabilities are emerging in areas that have historically embraced 3D graphics, the large number of jobs requesting CAD skills presents an opportunity for real-time 3D.

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\(^1\) Specifically, data science, data mining, and machine learning.
Table 1: Job openings and relative growth of 3D graphics skills by career area

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>150,818</td>
<td>15%</td>
</tr>
<tr>
<td>Information technology</td>
<td>38,312</td>
<td>36%</td>
</tr>
<tr>
<td>Construction and architecture</td>
<td>20,509</td>
<td>34%</td>
</tr>
<tr>
<td>Design and media</td>
<td>15,943</td>
<td>-15%</td>
</tr>
<tr>
<td>Business management</td>
<td>12,686</td>
<td>9%</td>
</tr>
<tr>
<td>Sales</td>
<td>8,718</td>
<td>104%</td>
</tr>
<tr>
<td>Manufacturing and production</td>
<td>8,690</td>
<td>-7%</td>
</tr>
<tr>
<td>Planning and analysis</td>
<td>5,194</td>
<td>21%</td>
</tr>
<tr>
<td>Repair and installation</td>
<td>3,822</td>
<td>11%</td>
</tr>
<tr>
<td>Education and training</td>
<td>3,322</td>
<td>-35%</td>
</tr>
<tr>
<td>Health care</td>
<td>3,080</td>
<td>9%</td>
</tr>
<tr>
<td>Marketing and public relations</td>
<td>2,947</td>
<td>67%</td>
</tr>
<tr>
<td>Science and research</td>
<td>1,810</td>
<td>22%</td>
</tr>
</tbody>
</table>

* Career areas with at least 1,500 openings requesting 3D graphics skills in 2018

3D graphics enjoys diverse use cases including industrial design for engineering and construction, and extended reality (XR) for IT and design.

During the year between October 2017 and October 2018, 13 career areas had more than 1,500 openings requesting 3D graphics skills. These career areas range from engineering and IT to sales and marketing. In a majority of these career areas, the rate at which these skills were requested increased between 2013 and 2018. That is, not only is demand for 3D graphics skills present in a wide range of professional fields, but in most of these fields, that demand is also putting down roots.

Engineering accounts for close to half (48%) of the job openings calling for 3D graphics skills, and 96% of those job openings request CAD skills. Proficiency with CAD software is integral to engineering. Currently 1 in 5 job openings in engineering requests at least one CAD skill. Real-time 3D skills are also important to engineering. Over 2,000 job postings in engineering require familiarity with real-time CAD techniques, and over 1,200 engineering postings call for real-time VR skills. Other career areas where demand for 3D graphics is synonymous with demand for CAD skills are construction (97% of demand for 3D graphics is for CAD skills), manufacturing (93%), and repair and installation (92%).

In information technology, the 3D graphics skills in greatest demand are related to creating immersive extended reality (XR) experiences. These include skills like 3D animation, rendering, and 3D modeling, as well as proficiency with game engines and VR. Together these skills account for 56% of demand for 3D graphics in information technology. The same is true for design and media, where these skills account for 58% of demand for 3D graphics.

Overall, demand for 3D graphics skills is highly concentrated in five career areas: engineering, information technology, construction and architecture, design and media, and manufacturing and production.

2. CAD—or computer-aided design—skills mean proficiency with the computer technologies that organize, document, and facilitate the design of a physical product.
Table 2: Demand concentration for 3D graphics skills by career area

<table>
<thead>
<tr>
<th>Career area</th>
<th>% more concentrated than in the market overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>+1,604%</td>
</tr>
<tr>
<td>Construction and architecture</td>
<td>+268%</td>
</tr>
<tr>
<td>Design and media</td>
<td>+244%</td>
</tr>
<tr>
<td>Information technology</td>
<td>+24%</td>
</tr>
<tr>
<td>Manufacturing and production</td>
<td>+7%</td>
</tr>
</tbody>
</table>

Labor market demand for real-time 3D skills is spreading at a faster rate than demand for 3D graphics skills as a whole. The share of 3D graphics jobs requesting real-time skills has grown 137% since 2013, from 4% to 10% of all 3D graphics openings. The share of all openings requesting real-time 3D has increased 164% since 2013. Between October 2017 and October 2018, there were more than 30,000 openings requesting real-time 3D.

Table 3: Job openings and relative growth of real-time 3D skills by career area

<table>
<thead>
<tr>
<th>Career area</th>
<th>Openings requesting skills</th>
<th>Growth in share of career area requesting skills (2013-2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information technology</td>
<td>11,441</td>
<td>129%</td>
</tr>
<tr>
<td>Engineering</td>
<td>4,053</td>
<td>189%</td>
</tr>
<tr>
<td>Design and media</td>
<td>2,724</td>
<td>83%</td>
</tr>
<tr>
<td>Sales</td>
<td>1,722</td>
<td>402%</td>
</tr>
<tr>
<td>Construction and architecture</td>
<td>1,192</td>
<td>180%</td>
</tr>
<tr>
<td>Marketing and public relations</td>
<td>1,091</td>
<td>669%</td>
</tr>
<tr>
<td>Business management</td>
<td>1,002</td>
<td>363%</td>
</tr>
<tr>
<td>Education and training</td>
<td>820</td>
<td>73%</td>
</tr>
<tr>
<td>Analysis</td>
<td>600</td>
<td>186%</td>
</tr>
</tbody>
</table>

* Career areas with at least 500 openings requesting real-time 3D graphics skills in 2018
Demand for workers skilled in real-time 3D is greatest in information technology (11,441 openings between October 2017 and October 2018), engineering (4,053), and design and media (2,724). These professionals use real-time 3D for industrial design or to develop immersive XR experiences, and the fruits of their labor are then brought to market by those in business management, sales, and marketing. Since 2013, the greatest increase in absolute demand for real-time 3D skills was in positions related to content creation and product development, such as software developers, multimedia designers, and artists. Compared to 2013, in 2018 Burning Glass captured over 7,500 more openings in IT calling for these skills, over 2,500 more openings in engineering, and over 1,800 more openings in design and media.

Real-time 3D skills are among the fastest growing in the market.

Although demand for real-time 3D skills is already growing considerably faster than the rest of the job market, specific skills within the field are experiencing even more rapid growth. For example, demand for proficiency with VR is projected to grow 189% over the next 10 years, while demand for knowledge of Oculus and HoloLens—two leading VR and AR technologies—is projected to grow by 185% and 28%, respectively. Skills related to game engines are also experiencing transformative growth. Over the next ten years, demand for candidates with Unreal Engine skills is projected to grow 122%, and demand for those with Unity skills is expected to grow 72%. Technologies within the CAD skill set that embrace real-time rendering are also projected to show substantial growth. Demand for proficiency in Navisworks, for example, is set to grow 110% over the next 10 years.

<table>
<thead>
<tr>
<th>Skill</th>
<th>10-year projected growth rate in demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented reality (AR)</td>
<td>207%</td>
</tr>
<tr>
<td>Virtual reality (VR)</td>
<td>189%</td>
</tr>
<tr>
<td>Oculus</td>
<td>185%</td>
</tr>
<tr>
<td>Unreal Engine</td>
<td>122%</td>
</tr>
<tr>
<td>Unity</td>
<td>72%</td>
</tr>
<tr>
<td>HoloLens</td>
<td>28%</td>
</tr>
<tr>
<td>Overall labor market</td>
<td>10%</td>
</tr>
</tbody>
</table>

Just as certain real-time 3D skills are growing rapidly, certain occupations demanding these skills are also among the fastest growing. For instance, demand for video game developers—who may use real-time 3D programs like Unreal Engine or Unity—is projected to grow over 20% in the next 10 years, twice as fast as the overall market. The projected growth in demand is also high for GIS specialists and for multiple engineering professions, among whom CAD skills are already in high demand.

The occupations with the greatest number of job openings for real-time 3D skills are also projected to grow, often at a faster rate than the overall labor market.

**Employers add value with real-time 3D**

Within the world of 3D graphics, some of the fastest-growing skills are related to real-time 3D: VR, AR, visual engines. Firms employ these skills at the cutting edge of research and development. Researchers at General Motors request Unreal Engine in job postings related to their work on autonomous vehicles. Job postings for Facebook’s Social VR Team request familiarity with game engines, too.
Table 5: Fast-growing jobs commonly requiring real-time 3D skills

<table>
<thead>
<tr>
<th>Occupation</th>
<th>10-year projected growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video game developer</td>
<td>21%</td>
</tr>
<tr>
<td>GIS specialist</td>
<td>19%</td>
</tr>
<tr>
<td>Robotics engineer</td>
<td>15%</td>
</tr>
<tr>
<td>Transportation engineer</td>
<td>12%</td>
</tr>
<tr>
<td>Overall labor market</td>
<td>10%</td>
</tr>
</tbody>
</table>

3D graphics skills command hefty salaries, and there is an even larger salary premium for mastering real-time 3D.

Job openings requesting at least one 3D graphics skill have an average advertised salary of $73,513—34% above the average advertised salary of $55,000. Job openings requesting real-time 3D have an advertised salary of $86,533, a premium of 57% above the average salary and 18% above the average salary for jobs requesting 3D graphics skills.

Emerging real-time 3D skills earn the highest salary premiums.

Skills that expand the boundaries of what’s possible in 3D earn the highest salary premiums. These include proficiencies with game engines, which are most frequently requested in job openings for video game artists and engineers, but also appear in job openings for computer programmers and mobile app developers. In this category, Unreal Engine claims the highest salary premium, and proficiency in this skill adds a salary premium of 51% for artists, 22% for computer programmers, and 5% for video game designers.

Table 6: Occupations with the greatest demand for real-time 3D skills

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Openings requesting skills (2018)</th>
<th>10-year projected growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software developer / engineer</td>
<td>5,011</td>
<td>27%</td>
</tr>
<tr>
<td>Artist / illustrator</td>
<td>951</td>
<td>-1%</td>
</tr>
<tr>
<td>Mobile applications developer</td>
<td>678</td>
<td>28%</td>
</tr>
<tr>
<td>Architect</td>
<td>665</td>
<td>7%</td>
</tr>
<tr>
<td>Computer systems engineer</td>
<td>626</td>
<td>16%</td>
</tr>
<tr>
<td>Multimedia designer / animator</td>
<td>601</td>
<td>-1%</td>
</tr>
<tr>
<td>CAD designer / drafter</td>
<td>590</td>
<td>7%</td>
</tr>
<tr>
<td>Overall labor market</td>
<td></td>
<td>10%</td>
</tr>
</tbody>
</table>

Skills related to VR also fetch large salary premiums. These skills are most commonly requested in job openings for occupations in information technology, such as software developers and mobile app developers. However, demand is also emerging for these skills in science and research. In fact, the salary premium for proficiency with Oculus technology is 77% for researchers compared to 15% for software developers.

The 3D graphics skills with the highest salary premiums are associated with new real-time technologies. Some industrial design and product lifecycle management skills also command high salary premiums. Mastering 3D graphics skills, particularly real-time 3D skills, can lead to large salary increases.
REAL-TIME 3D IS ASSOCIATED WITH A LARGE SALARY PREMIUM:

57%

AND

18%

ABOVE THE AVERAGE ADVERTISED SALARY

ABOVE THE AVERAGE ADVERTISED SALARY FOR JOBS REQUESTING 3D GRAPHICS SKILLS IN GENERAL

Image courtesy of GE's Industrial Interactive
5. Implications

These findings underscore that demand for 3D graphics skills is strong, yet unmet, and is only likely to continue its upward trajectory. Employers, students, and workers can collectively benefit by taking steps to prepare themselves for the further integration of these skills into many occupations and career areas.

Students and existing workers

Students and workers who add these skills to their portfolio reap the benefits of increased salaries and diversified career opportunities. Students and existing workers can seek out opportunities to learn these skills in the classroom, on the job, or through extracurricular activities. Incumbent workers should remain abreast of emerging 3D technologies in their career fields. Real-time 3D is a basket of such skills. Workers in engineering, information technology, construction and architecture, and design can potentially benefit by upskilling with real-time 3D skills.

Mastering 3D graphics and real-time 3D skills offers a variety of benefits to incumbent workers and to students who will eventually enter the workforce. Workers and students interested in career mobility should develop competencies in computer-aided design, since these skills are in demand in a variety of career areas. Workers and students interested in working on the cutting edge of technology should develop the software skills applicable to fields such as VR, real-time rendering, and game engines, since demand for these skills has the highest projected growth.

FOR STUDENTS OR NEW ENTRANTS TO THE JOB MARKET, MASTERING 3D GRAPHICS SKILLS CAN LEAD TO A SALARY PREMIUM OF 24% OVER OTHER ENTRY-LEVEL JOBS, AND MASTERING REAL-TIME 3D CAN LEAD TO A SALARY PREMIUM OF 45% ABOVE OTHER ENTRY-LEVEL JOBS
Employers

Employers should develop these skills within their own talent pool. Employers can benefit from the efficiencies gained from 3D graphics technology and real-time 3D skills across a range of use cases. Increasing demand for these skills in business fields like sales, marketing, and management suggest that the underlying technologies are being commercialized successfully. But hiring for these skills is already challenging, and demand is only projected to grow. Employers hoping to leverage 3D graphics and real-time 3D can develop training programs internally or build relationships with educational institutions and workforce development organizations to train their workers in the relevant real-time and 3D graphics skills.

Conclusion

3D graphics and real-time 3D are multifaceted and evolving skill sets. While some skills are in demand across many career areas, others are more concentrated in select fields. Changes in skill demand over time reflect the progress and innovation within 3D graphics and real-time 3D. Even as use of one 3D technology becomes widespread across the broader economy, demand for new but related technologies grows behind the standard bearer. Just as computer-assisted design brought 2D drafting into three dimensions, the emerging capabilities of real-time 3D add another dimension with which architects, engineers, designers, and artists can work, while spreading to new use cases in new occupations.

The implications of this evolving skill set are clear. Students and incumbent workers should understand the benefits accrued to those who learn these capabilities, including higher salaries, improved career mobility, and the ability to shape the way the world and technology interact. Employers should integrate these skills into their own talent pool and identify new use cases for increased productivity or improved product experiences. The opportunities associated with 3D graphics and real-time 3D are widespread—now it is up to students, workers, and employers to realize them.
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About Burning Glass

Burning Glass Technologies delivers job market analytics that empower employers, workers, and educators to make data-driven decisions. The company’s artificial intelligence technology analyzes hundreds of millions of job postings and real-life career transitions to provide crucial insights, such as which jobs are most in demand, the specific skills employers need, and the career directions that offer the highest potential for workers. Find out more at burning-glass.com.

About Epic Games and Unreal Engine

Founded in 1991, Epic Games is the creator of Fortnite, Unreal, Gears of War, Shadow Complex, and the Infinity Blade series of games. Developed by Epic Games, Unreal Engine brings high-fidelity experiences to PC, console, mobile, VR, and AR platforms. Unreal Engine accelerates the creation of games, applications, visualizations, and cinematic content. Download Unreal Engine for free at unrealengine.com, and follow @UnrealEngine for updates.