



# Computer Graphics and Digital Imagery

*Inland Empire/Desert Region (Riverside-San Bernardino-Ontario Metropolitan Statistical Area) & Los Angeles and Orange Counties*

## Summary

- Occupations in the computer graphics and digital imagery group are projected to have **1,354 job openings** over the next five years (2017-2022) in the Inland Empire/Desert Region.
- The median wage for each occupation in the computer graphics and digital imagery occupational group is **above the MIT Living Wage estimate of \$12.30 per hour** for a single adult living in the Inland Empire/Desert Region.
- There appears to be an **opportunity for program growth** based on the average annual number of program completions for the selected community college program (**18 average annual community college credentials**) and the annual openings for computer graphics and digital imagery occupations in the region (**271 annual job openings**).

## Introduction

This report details occupations relevant to the computer graphics and digital imagery program. The computer graphics and digital imagery program imparts students with the theories, principles, and uses of computer graphics vector- and raster-based software programs for consumer, commercial, and industrial applications.<sup>1</sup> Labor market demand data for Los Angeles and Orange counties are included in this report in addition to the Inland Empire/Desert region. There are approximately ten times more job opportunities for the computer graphics and digital imagery occupational group in Los Angeles and Orange counties than in the Inland Empire/Desert region. The occupations included in the computer graphics and digital imagery occupational group are:

- Graphic Designers
- Multimedia Artists and Animators

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<sup>1</sup> The Taxonomy of Programs, 6<sup>th</sup> Edition, February 2004

## Job Opportunities

In 2017, there were 31,472 computer graphics and digital imagery jobs in the Inland Empire/Desert region & Los Angeles and Orange counties combined. This occupational group is projecting to increase employment by 2% over the next five years. Employers in the region will need to hire 14,663 workers over the projection period to backfill jobs that workers are permanently vacating (includes retirements). Appendix A, Tables 1, 2, & 3 show the projected job growth, wages, education, training, and work experience required for each of the occupations in this group for the Inland Empire/Desert region, Los Angeles and Orange counties, as well as both geographies combined.

*Exhibit 1: Five-year projections for the computer graphics and digital imagery occupational group in the Inland Empire/Desert region & Los Angeles and Orange counties*

Region	2017 Jobs	5-Yr % Change (New Jobs)	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
Inland Empire/Desert	2,776	3%	1,354	271	22%
Los Angeles and Orange Counties	28,696	2%	13,309	2,662	20%
<b>Total</b>	<b>31,472</b>	<b>2%</b>	<b>14,663</b>	<b>2,933</b>	<b>20%</b>

Source: EMSI 2018.3

Exhibit 2 shows the number of job ads posted during the last 12 months along with the regional and national average time to fill for both regions. On average, it takes 41 days for employers to find qualified candidates to fill open positions in the Inland Empire/Desert region and Los Angeles and Orange counties combined. This is one week longer than the national average, indicating that when compared to the nation, open positions are harder to fill in the region.

*Exhibit 2: Job ads by each of the computer graphics and digital imagery occupations in the Inland Empire/Desert region & Los Angeles and Orange counties region and time to fill, November 2017 – October 2018*

Occupation	Job Ads	Regional Average Time to Fill (Days)	National Average Time to Fill (Days)
Graphic Designers	3,886	41	33
Multimedia Artists and Animators	842	41	37
<b>Total</b>	<b>4,728</b>	<b>-</b>	<b>-</b>

Source: Burning Glass – Labor Insights

## Earnings

The median wage for each of the occupations in the computer graphics and digital imagery occupational group is above the MIT Living Wage estimate of \$12.30 per hour for a single adult living in the Inland Empire/Desert region (\$13.96 for Los Angeles and Orange counties). The experienced-level wages are sufficient for two working adults and one child (\$14.50 per hour, per adult or \$30,160 annually for each adult). Exhibit 3 displays wage information by region for this occupational group.

*Exhibit 3: Earnings for the computer graphics and digital imagery occupational group in the Inland Empire/Desert Region & Los Angeles and Orange counties*

Region	Occupation	Entry to Experienced Hourly Earnings Range*	Median Wage*	Avg. Annual Earnings
Inland Empire/Desert	Graphic Designers	\$17.25 to \$23.93	\$19.67	\$45,100
	Multimedia Artists and Animators	\$11.98 to \$20.77	\$14.20	\$36,00
Los Angeles/Orange County	Multimedia Artists and Animators	\$17.18 to \$45.16	\$31.62	\$70,400
	Graphic Designers	\$17.77 to \$29.57	\$21.34	\$51,800

Source: EMSI 2018.3

\*Entry Hourly is 25th percentile wage, the median is 50th percentile wage, experienced is 75th percentile wage.

## Employers, Skills, and Education

Exhibit 4 displays the top employers posting job ads during the last 12 months.

*Exhibit 4: The top employers for the computer graphics and digital imagery occupational group in the Inland Empire/Desert region & Los Angeles and Orange counties during the last 12 months, November 2017 – October 2018*

Occupation	Top Employers
Graphic Designers (n=2,716)	<ul style="list-style-type: none"> <li>California State University</li> <li>Full Deck Marketing</li> </ul>
Multimedia Artists and Animators (n=565)	<ul style="list-style-type: none"> <li>Activision</li> <li>Electronic Arts</li> </ul>

Source: Burning Glass – Labor Insights

Exhibit 5 lists a sample of in-demand specialized, employability, and software and programming skills that employers are seeking when looking for workers to fill computer graphics and digital imagery positions.

*Exhibit 5: Sample of in-demand skills from employer job ads for computer graphics and digital imagery occupations in the Inland Empire/Desert region & Los Angeles and Orange counties, November 2017 – October 2018*

Occupation	Specialized Skills	Employability Skills	Software and Programming Skills
Graphic Designers (n=3,627)	<ul style="list-style-type: none"> <li>• Social Media</li> <li>• Typesetting</li> <li>• Web Site Design</li> </ul>	<ul style="list-style-type: none"> <li>• Creativity</li> <li>• Communication Skills</li> <li>• Detail-Oriented</li> </ul>	<ul style="list-style-type: none"> <li>• Adobe Creative Suite</li> <li>• Microsoft Office</li> </ul>
Multimedia Artists and Animators (n=726)	<ul style="list-style-type: none"> <li>• Graphic Design</li> <li>• Motion Graphics</li> <li>• Game Development</li> </ul>	<ul style="list-style-type: none"> <li>• Creativity</li> <li>• Teamwork/ Collaboration</li> <li>• Communication Skills</li> </ul>	<ul style="list-style-type: none"> <li>• Adobe Creative Suite</li> <li>• Maya</li> <li>• Cinema 4D</li> </ul>

Source: Burning Glass – Labor Insights

Exhibit 6 displays the entry-level education typically required to enter each occupation according to the Bureau of Labor Statistics, educational attainment for incumbent workers with “some college, no degree” and an “associate degree” according to the U.S. Census, and the minimum advertised education requirement requested by employers in online job ads.

*Exhibit 6: Educational attainment and online job ads with minimum advertised education requirements for the computer graphics and digital imagery occupational group in the Inland Empire/Desert region & Los Angeles and Orange counties combined, November 2017 – October 2018*

Occupation	Work Experience Required	Typical Entry-Level Education Requirement	Two-Year Postsecondary Level of Educational Attainment*	Minimum Advertised Education Requirement from Job Ads			
				Number of Job Postings (n=)	High school diploma or vocational training	Associate degree	Bachelor's degree or higher
Graphic Designers	None	Bachelor's degree	29%	1,773	9%	8%	83%
Multimedia Artists and Animators	None	Bachelor's degree	27%	247	2%	5%	93%

Source: EMSI 2018.3, Current Population Survey, Burning Glass – Labor Insights

\*Percentage of incumbent workers with a Community College Credential or Some Postsecondary Coursework

## Student Completions

Exhibits 7 shows the annual average regional community college credentials (associate degrees and certificates) conferred during the three academic years between 2014 and 2017, with the relevant TOP code as well as the program titles used at each college, sourced from the Chancellor’s Office Curriculum Inventory (COCI). Please note, a credential is not equivalent to a single person in search of a job opening since a student may earn more than one award, such as an associate degree in addition to a certificate. Community College student outcome information is from the CTE LaunchBoard based on the selected TOP code(s) and region.

*Exhibit 7: Annual average community college student completions for computer graphics and digital imagery programs in the Inland Empire/Desert region*

<b>0614.60 – Computer Graphics and Digital Imagery</b>	<b>Annual Community College Headcount (2016-17)</b>	<b>Community College Annual Average Credentials (2014-17)</b>
<b>Chaffey</b>	78	
Associate Degree		2
Certificate 30 to < 60-semester units		1
<b>Copper Mountain</b>	10	
<b>Crafton Hills</b>		
Certificate 18 to < 30-semester units		1
<b>Desert</b>		
Associate Degree		5
Certificate 18 to < 30-semester units		5
<b>Palo Verde</b>		
Certificate 6 to < 18-semester units		4
<b>Riverside</b>	68	
<b>Total community college headcount (2016-17)</b>	<b>156</b>	
<b>Total annual average community college credentials</b>		<b>18</b>

Source: LaunchBoard, IPEDS, COCI

\*Moreno Valley awarded one associate degree in 2015-16



**0614.60- Computer Graphics and Digital Imagery program Strong Workforce outcomes in the Inland Empire/Desert region in the academic year 2015-16 [unless noted otherwise]:**

- Number of course enrollments: 635 (California median: 155) [2016-17]
- Number of students who transferred to a 4-year institution: 27 (CA: 17)
- Employed in the second fiscal quarter after exit: 65% (CA: 67%)
- Median earnings in the second fiscal quarter after exit: \$4,880 (CA: \$6,045)
- Employed in the fourth fiscal quarter after exit: 65% (CA: 64%)
- Median annual earnings: \$15,042 (CA: \$20,532)
- The percentage in a job closely related to the field of study: N/A (CA: 63%) [2014-15]
- Median change in earnings: 87% (CA: 52%)
- The proportion of students who attained a living wage: 20% (CA: 44%)

## Sources

O\*Net Online

Labor Insight/Jobs (Burning Glass)

Economic Modeling Specialists International (EMSI)

CTE LaunchBoard

MIT Living Wage Calculator

Chancellor's Office Curriculum Inventory (COCI, version 2.0)

The Integrated Postsecondary Education Data System (IPEDS)

Taxonomy of Programs, 6<sup>th</sup> edition

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## **Appendix A: Occupation definitions, sample job titles, five-year projections, and earnings for computer graphics and digital imagery occupations**

### **Occupation Definitions (SOC code), Education and Training Requirement, Community College Education Attainment**

#### **Multimedia Artists and Animators (27-1014)**

Create special effects, animation, or other visual images using film, video, computers, or other electronic tools and media for use in products or creations, such as computer games, movies, music videos, and commercials.

**Sample job titles:** *3D Animator, 3D Artist, Animation Director, Animator, Art Director, Artist, Creative Director, Graphic Artist, Graphic Designer, Illustrator*

*Entry-Level Educational Requirement: Bachelor's degree*

*Training Requirement: None*

*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 27%*

#### **Graphic Designers (27-1024)**

Design or create graphics to meet specific commercial or promotional needs, such as packaging, displays, or logos. May use a variety of mediums to achieve artistic or decorative effects.

**Sample job titles:** *Artist, Creative Director, Creative Manager, Design Director, Designer, Graphic Artist, Graphic Designer, Online Producer, Production Artist, Publications Designer*

*Entry-Level Educational Requirement: Bachelor's degree*

*Training Requirement: None*

*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 29%*



Table 1. 2017 to 2022 job growth, wages, education, training, and work experience required for the computer graphics and digital imagery occupational group, Inland Empire/Desert region

Occupation (SOC)	2017 Jobs	5-Yr Change	5-Yr % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage*	Median Hourly Wage*	Average Annual Earnings	Typical Entry-Level Education & On-The-Job Training Required	Work Experience Required
Graphic Designers (27-1024)	2,482	65	3%	244	\$17.25 to \$23.93	\$19.67	\$45,100	Bachelor's degree & none	None
Multimedia Artists and Animators (27-1014)	294	14	5%	26	\$11.98 to \$20.77	\$14.20	\$36,00	Bachelor's degree & none	None
<b>Total</b>	<b>2,776</b>	<b>79</b>	<b>3%</b>	<b>271</b>	-	-	-	-	-

Source: EMSI 2018.3

\*Entry Hourly is 25th percentile wage, the median is 50th percentile wage, experienced is 75th percentile wage

Table 2. 2017 to 2022 job growth, wages, education, training, and work experience required for the computer graphics and digital imagery occupational group, Los Angeles and Orange counties

Occupation (SOC)	2017 Jobs	5-Yr Change	5-Yr % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage*	Median Hourly Wage*	Average Annual Earnings	Typical Entry-Level Education & On-The-Job Training Required	Work Experience Required
Graphic Designers (27-1024)	20,290	(2)	(0%)	1,877	\$17.77 to \$29.57	\$21.34	\$51,800	Bachelor's degree & none	None
Multimedia Artists and Animators (27-1014)	8,406	544	6%	785	\$17.18 to \$45.16	\$31.62	\$70,400	Bachelor's degree & none	None
<b>Total</b>	<b>28,696</b>	<b>542</b>	<b>2%</b>	<b>2,662</b>	-	-	-	-	-

Source: EMSI 2018.3

\*Entry Hourly is 25th percentile wage, the median is 50th percentile wage, experienced is 75th percentile wage



Table 3. 2017 to 2022 job growth, wages, education, training, and work experience required for the computer graphics and digital imagery occupational group, Inland Empire/Desert region & Los Angeles and Orange counties combined

Occupation (SOC)	2017 Jobs	5-Yr Change	5-Yr % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage*	Median Hourly Wage*	Average Annual Earnings	Typical Entry-Level Education & On-The-Job Training Required	Work Experience Required
Graphic Designers (27-1024)	22,772	64	0%	2,122	\$17.70 to \$29.01	\$21.08	\$51,000	Bachelor's degree & none	None
Multimedia Artists and Animators (27-1014)	8,700	558	6%	811	\$16.55 to \$44.81	\$30.84	\$69,200	Bachelor's degree & none	None
<b>Total</b>	<b>31,472</b>	<b>622</b>	<b>2%</b>	<b>2,933</b>	-	-	-	-	-

Source: EMSI 2018.3

\*Entry Hourly is 25th percentile wage, the median is 50th percentile wage, experienced is 75th percentile wage