# Electronic Game Design Occupations

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

## Summary

- The electronic game design occupational group is projected to **increase by 11% between 2017 and 2022** in the Inland Empire/Desert region. **A total of 1,432 job openings** will be available over the next five years.

- The median wage for each occupation in the electronic game design 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 electronic game design occupations in the region **(286 annual new job openings).**

## Introduction

This report details occupations relevant to the electronic game design program. The electronic game design program prepares individuals for entry-level designer positions through the instruction of the game design process and techniques and tools for rapid prototyping.[1] Labor market demand data for Los Angeles and Orange counties are included this report in addition to the Inland Empire/Desert region. The occupations included in the electronic game design occupational group are:

- Computer Programmers
- Multimedia Artists and Animators
- Software Developers, Applications
- Video Game Designers[2]

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[1] Norco College, College Catalog 2018-2019, pg. 109

[2] Traditional labor market information is not available for this emerging occupation, only job posting data. See page four for job posting data, and page 11 for more information about this distinction.

The industry that captures the majority of employment for electronic game design is the software publishing industry (NAICS 51-1210). Businesses in this industry may design, develop, and publish software and games, or they may publish only.[3] This report includes employment data within this industry in addition to total employment.

## Job Opportunities

In 2017, there were 50,019 combined electronic game design occupational group jobs in the Inland Empire/Desert region & Los Angeles and Orange counties. However, only 3,455, or 7% of these jobs are employed within the software publishing industry. Please note that the job numbers displayed in Exhibit 1 are for traditional employer-employee relationship and self-employment jobs. There may be many additional opportunities in the software publishing industry for freelance, gig-economy, temporary, or project-based jobs, which are not entirely reflected in the job counts. 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 County counties, as well as both geographies combined.

*Exhibit 1: Five-year projections for the electronic game design occupational group within the software publishing industry in the Inland Empire/Desert Region and Los Angeles and Orange counties*

| Region | Total 2017 Jobs | Software Publishing 2017 Jobs* | % Employed within Software Publishing Industry |
|---|---|---|---|
| Inland Empire/Desert | 3,206 | 69 | 2% |
| Los Angeles and Orange Counties | 46,813 | 3,376 | 7% |
| **Combined Total** | **50,019** | **3,455** | **7%** |

Source: EMSI 2018.3
*Accounts for employment within NAICS 51-1210 only.

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[3] North American Industry Classification System, 2017 NAICS Definition

## Earnings

The median wage for each of the occupations in the electronic game design 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 2 displays wage information by region for this occupational group.

*Exhibit 2: Earnings for the electronic game design 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 | Software Developers, Applications | $36.04 to $55.32 | $45.08 | $95,600 |
| | Computer Programmers | $28.02 to $43.93 | $34.26 | $75,100 |
| | Multimedia Artists and Animators | $11.98 to $20.77 | $14.20 | $36,000 |
| Los Angeles and Orange Counties | Software Developers, Applications | $39.81 to $65.61 | $53.05 | $112,900 |
| | Computer Programmers | $31.31 to $52.08 | $40.11 | $87,600 |
| | Multimedia Artists and Animators | $17.18 to $45.16 | $31.62 | $70,400 |

Source: EMSI 2018.3
*Entry Hourly is 25th percentile wage, the median is 50th percentile wage, experienced is 75th percentile wage.

## Online Job Postings

Exhibit 3 shows the number of job ads posted during the last 12 months for each occupation overall, as well as postings exclusively from known electronic game employers, along with the regional and national average time to fill for both regions combined. On average, it takes 43 days for employers to find qualified candidates to fill open positions in the Inland Empire/Desert region & Los Angeles and Orange counties combined. This is four days longer than the national average, indicating that when compared to the nation, open positions may be harder to fill in the region.

While traditional labor market information is not available for video game designers, job posting data provides the ability to isolate the demand specific to this emerging occupation. Exhibit 3 displays the number of jobs ads for each occupation overall, as well as within the software publishing industry over the last 12 months.

Although there are only a combined total of 689 job postings from electronic game employers, there are ample opportunities for workers in these occupations within other industries.

*Exhibit 3: Job ads by each of the electronic game design Inland Empire/Desert region & Los Angeles and Orange counties and time to fill, November 2017 – October 2018*

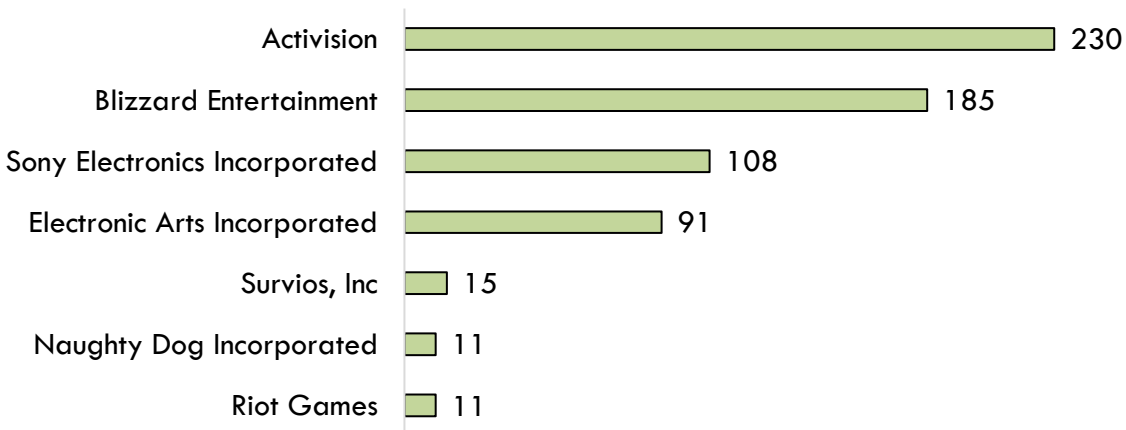| Occupation | Overall Job Ads | Electronic Game Employer Job Ads | Regional Average Time to Fill (Days) | National Average Time to Fill (Days) |
|---|---|---|---|---|
| Software Developers, Applications | 35,854 | 396 | 43 | 39 |
| Video Game Designers* | 632 | 150 | 47 | 43 |
| Multimedia Artists and Animators | 842 | 117 | 41 | 37 |
| Computer Programmers | 2,449 | 26 | 42 | 37 |
| **Total** | **39,777** | **689** | - | - |

Source: Burning Glass – Labor Insights
*Video game designers (15-1199.11) is an emerging occupation and is embedded within the broader occupation, computer occupations, all other (15-1199). See page 10 for more information about this distinction.

# Top Electronic Game Employers

Exhibit 4 displays the top electronic game employers posting job ads during the last 12 months, mostly within the software publishing industry. Activision and Blizzard Entertainment frequently posted job ads seeking electronic game design occupations.

*Exhibit 4: Top electronic game employers posting job ads in the Inland Empire/Desert Region & Los Angeles and Orange counties, November 2017 – October 2018*

| Employer | Job Ads |
|---|---|
| Activision | 230 |
| Blizzard Entertainment | 185 |
| Sony Electronics Incorporated | 108 |
| Electronic Arts Incorporated | 91 |
| Survios, Inc | 15 |
| Naughty Dog Incorporated | 11 |
| Riot Games | 11 |

Source: Burning Glass – Labor Insights

Other notable electronic game employers posting job ads are Survios (8 job postings), Versus Systems (6), Insomniac Games (5), Riot Games Inc. (5), Bonfire Studios (4), Jam City (4), Carbine Studios (3), Treyarch (2), and Scopely (1).

Exhibit 5 displays the top electronic game employer postings job adds for each occupation in the electronic game design occupational group.

*Exhibit 5: The top employers for the electronic game design occupational group in the Inland Empire/Desert Region & Los Angeles and Orange counties, November 2017 – October 2018*

| Occupation | Top Employers |
|---|---|
| Software Developers, Applications *(n=396)* | • Blizzard Entertainment<br>• Activision<br>• Sony Electronics<br>• Electronic Arts |
| Video Game Designers *(n=150)* | • Activision<br>• Blizzard Entertainment<br>• Electronic Arts<br>• Survios |
| Multimedia Artists and Animators *(n=117)* | • Activision<br>• Electronic Arts<br>• Blizzard Entertainment |
| Computer Programmers *(n=26)* | • Sony Electronics<br>• Naughty Dog<br>• Activision |

Source: Burning Glass – Labor Insights

## Top Skills

Exhibit 6 lists a sample of in-demand specialized, employability, and software and programming skills that electronic game employers are seeking when looking for workers to fill positions. The skills reported in job postings may be utilized as a helpful guide for curriculum development. Specialized skills are occupation-specific skills employers are requesting for industry or job competency. Employability skills are foundational skills that transcend industries and occupations; this category is commonly referred to as "soft skills."

*Exhibit 6: Sample of in-demand skills from employer job ads for electronic game design occupations in the Inland Empire/Desert Region & Los Angeles and Orange counties, November 17–October 18*

| Occupation | Specialized Skills | Employability Skills | Software and Programming Skills |
|---|---|---|---|
| Software Developers, Applications *(n=365)* | • Game Development<br>• Debugging<br>• Software Engineering | • Communication Skills<br>• Teamwork/ Collaboration<br>• Creativity | • C++<br>• Python<br>• JavaScript<br>• Microsoft C# |
| Video Game Designers *(n=137)* | • Game Development<br>• Level Design<br>• Painting | • Communication Skills<br>• Creativity<br>• Teamwork/ Collaboration | • Adobe Photoshop<br>• Maya<br>• ZBrush<br>• C++ |
| Multimedia Artists and Animators *(n=113)* | • Game Development<br>• Motion Capture<br>• Troubleshooting Technical Issues | • Creativity<br>• Teamwork/ Collaboration<br>• Problem Solving | • Maya<br>• Python<br>• Adobe Photoshop<br>• Motionbuilder |
| Computer Programmers *(n=26)* | • Content Management<br>• User Interface (UI) Design<br>• Python | • Written Communication<br>• Teamwork/ Collaboration<br>• Research | • C++<br>• Maya<br>• Java<br>• SQL |

Source: Burning Glass – Labor Insights

## Education Requirements

Exhibit 7 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. With the rare exception of multimedia artists and animators, all electronic game employers are seeking candidates with a bachelor's degree for this occupations.

*Exhibit 7: Educational attainment and online job ads with minimum advertised education requirements for the electronic game design 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 |
| Software Developers, Applications | None | Bachelor's degree | 13% | 208 | - | - | 100% |
| Video Game Designers | None | Bachelor's degree | 35% | 50 | - | - | 100% |
| Multimedia Artists and Animators | None | Bachelor's degree | 27% | 12 | 17% | - | 83% |
| Computer Programmers | None | Bachelor's degree | 22% | 23 | - | - | 100% |

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

Exhibit 8 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 8: Annual average community college student completions for electronic game design programs in the Inland Empire/Desert region*

| 0614.20 – Electronic Game Design | Annual Community College Headcount (2016-17) | Community College Annual Average Credentials (2014-17) |
|---|---|---|
| **Moreno Valley** | 82 | |
| **Norco** – *Game Design/Game Art: Environments and Vehicles, Character Modeling, 3D Animation* | 478 | |
| Associate Degree | | 7 |
| Certificate 30 to <60-sememster units | | 6 |
| Certificate 18 to <30-semester units | | 4 |
| Certificate 6 to <18-semester units | | 1 |
| **Total community college headcount (2016-17)** | **558** | |
| **Total annual average community college credentials** | | **18** |

Source: LaunchBoard, IPEDS, COCI

**0614.20 – Electronic Game Design program Strong Workforce outcomes in the Inland Empire/Desert region in the academic year 2015-16 [unless noted otherwise]:**

- Number of course enrollments: 855 (California median: 58) [2016-17]
- Number of students who transferred to a 4-year institution: 33 (CA: 0)
- Employed in the second fiscal quarter after exit: 67% (CA: 71%)
- Median earnings in the second fiscal quarter after exit:$3,990 (CA: $4,063)
- Employed in the fourth fiscal quarter after exit: 58% (CA: 60%)
- Median annual earnings: $13,485  (CA: $13,967)
- Median change in earnings: 101% (CA: 94%)
- The proportion of students who attained a living wage: 36% (CA: N/A)

## 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)

North American Industry Classification System (NAICS)

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# Computer Occupations, All Other (SOC 15-1199)

Video game designers (15-1199.11) is included in a broader occupation code: computer occupations, all other (15-1199). It is important to note that the broader occupation code for computer occupations, all other also includes other computer occupations—such as software quality assurance engineers and testers, computer systems engineers/architects, and web administrators— that are not related to video game designers. The online job posting data in this report is tailored specifically to video game designers, but the traditional labor market information for computer occupations, all other is included in Exhibit 9 below.

Other emerging occupations included with computer occupations, all other include:

| | |
|---|---|
| 15-1199.01 | Software Quality Assurance Engineers and Testers |
| 15-1199.02 | Computer Systems Engineers/Architects |
| 15-1199.03 | Web Administrators |
| 15-1199.04 | Geospatial Information Scientists and Technologists |
| 15-1199.05 | Geographic Information Systems Technicians |
| 15-1199.06 | Database Architects |
| 15-1199.07 | Data Warehousing Specialists |
| 15-1199.08 | Business Intelligence Analysts |
| 15-1199.09 | Information Technology Project Managers |
| 15-1199.10 | Search Marketing Strategists |
| 15-1199.12 | Document Management Specialists |

*Exhibit 9: Demand for computer occupations, all other, 2017-2022, Inland Empire/Desert Region and Los Angeles/Orange counties combined*

| Region | 2017 Jobs | 5-Yr % Change | Annual Openings | Entry-Experienced Hourly Wage* | Median Hourly Wage* | Average Annual Earnings |
|---|---|---|---|---|---|---|
| Inland Empire/Desert | 1,918 | 7% | 157 | $26.52 to $48.74 | $37.22 | $79,700 |
| Los Angeles and Orange Counties | 15,836 | 4% | 1,176 | $25.41 to $53.22 | $37.62 | $84,000 |
| **Combined Total** | **17,753** | **4%** | **1,332** | **$25.53 to $52.66** | **$37.56** | **$83,600** |

Source: EMSI 2018.3
*Entry Hourly is 25th percentile wage, the median is 50th percentile wage, experienced is 75th percentile wage

# Appendix A: Occupation definitions, sample job titles, five-year projections, and earnings for electronic game design occupations

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

## Computer Programmers (15-1131)

Create, modify, and test the code, forms, and script that allow computer applications to run. Work from specifications drawn up by software developers or other individuals. May assist software developers by analyzing user needs and designing software solutions. May develop and write computer programs to store, locate, and retrieve specific documents, data, and information.

*Sample job titles: Analyst Programmer, Application Programmer Analyst, Computer Programmer, Computer Programmer Analyst, Internet Programmer, Java Developer, Programmer, Programmer Analyst, Web Applications Programmer, Web Programmer*

*Entry-Level Educational Requirement: Bachelor's degree*
*Training Requirement: None*
*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 22%*

## Software Developers, Applications (15-1132)

Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. May supervise computer programmers.

*Sample job titles: Application Developer, Application Integration Engineer, Applications Developer, Computer Consultant, Information Technology Analyst (IT Analyst), Software Architect, Software Developer, Software Development Engineer, Software Engineer, Technical Consultant*

*Entry-Level Educational Requirement: Bachelor's degree*
*Training Requirement: None*
*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 13%*

**Computer Occupations, All Other (15-1199)**

**Video Game Designers (15-1199.11)**

Design core features of video games. Specify innovative game and role-play mechanics, storylines, and character biographies. Create and maintain design documentation. Guide and collaborate with production staff to produce games as designed.

*Sample job titles: Design Director, Designer/Writer, Game Designer, Game Designer/Creative Director, Lead Designer, Lead Game Designer, Lead Level Designer, Mid Level Game Designer, Senior Game Designer, World Designer*

*Entry-Level Educational Requirement: Bachelor's degree*
*Training Requirement: None*
*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 35%*


**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%*

*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 28%*

*Table 1. 2017 to 2022 job growth, wages, education, training, and work experience required for the electronic game design occupational group, Inland Empire/Desert region*

| Occupation (SOC) | 2017 Jobs | 5-Yr Change | 5-Yr % Change | Entry-Experienced Hourly Wage* | Median Hourly Wage* | Average Annual Earnings | Typical Entry-Level Education & On-The-Job Training Required | Work Experience Required |
|---|---|---|---|---|---|---|---|---|
| Software Developers, Applications (15-1132) | 1,870 | 332 | 18% | $36.04 to $55.32 | $45.08 | $95,600 | Bachelor's degree & None | None |
| Computer Programmers (15-1131) | 1,041 | (4) | (0%) | $28.02 to $43.93 | $34.26 | $75,100 | Bachelor's degree & None | None |
| Multimedia Artists and Animators (27-1014) | 294 | 14 | 5% | $11.98 to $20.77 | $14.20 | $36,000 | Bachelor's degree & None | None |
| **Total** | **3,206** | **341** | **11%** | - | - | - | - | - |

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 electronic game design occupational group, Los Angeles and Orange counties*

| Occupation (SOC) | 2017 Jobs | 5-Yr Change | 5-Yr % Change | Entry-Experienced Hourly Wage* | Median Hourly Wage* | Average Annual Earnings | Typical Entry-Level Education & On-The-Job Training Required | Work Experience Required |
|---|---|---|---|---|---|---|---|---|
| Software Developers, Applications (15-1132) | 27,604 | 4,064 | 15% | $39.81 to $65.61 | $53.05 | $112,900 | Bachelor's degree & None | None |
| Computer Programmers (15-1131) | 10,803 | (397) | (4%) | $31.31 to $52.08 | $40.11 | $87,600 | Bachelor's degree & None | None |
| Multimedia Artists and Animators (27-1014) | 8,406 | 544 | 6% | $17.18 to $45.16 | $31.62 | $70,400 | Bachelor's degree & None | None |
| **Total** | **46,813** | **4,210** | **9%** | - | - | - | - | - |

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 electronic game design occupational group, Inland Empire/Desert region & Los Angeles and Orange counties combined*

| Occupation (SOC) | 2017 Jobs | 5-Yr Change | 5-Yr % Change | Entry-Experienced Hourly Wage* | Median Hourly Wage* | Average Annual Earnings | Typical Entry-Level Education & On-The-Job Training Required | Work Experience Required |
|---|---|---|---|---|---|---|---|---|
| Computer Programmers (15-1131) | 11,845 | (402) | (3%) | $30.91 to $51.15 | $39.63 | $86,500 | Bachelor's degree & None | None |
| Software Developers, Applications (15-1132) | 29,474 | 4,396 | 15% | $39.51 to $65.04 | $52.43 | $111,800 | Bachelor's degree & None | None |
| Multimedia Artists and Animators (27-1014) | 8,700 | 558 | 6% | $16.55 to $44.81 | $30.84 | $69,200 | Bachelor's degree & None | None |
| **Total** | **50,019** | **4,552** | **9%** | - | - | - | - | - |

Source: EMSI 2018.3
*Entry Hourly is 25th percentile wage, the median is 50th percentile wage, experienced is 75th percentile wage