

**Program Endorsement Brief: 0701.00/Information Technology, General
0799.00/Other Information Technology
Artificial Intelligence for Business**

Los Angeles/Orange County Center of Excellence, March 2020

Summary Analysis

The Los Angeles/Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data related to artificial intelligence for business. According to the January-February 2018 issue of the Harvard Business Review, artificial intelligence (AI) can support business needs through automating business processes, gaining insight through data analysis and mining, and by engaging with customers and employees.¹ Since this field of technology is relatively new, the Standard Occupational Classification (SOC) system has yet to classify artificial intelligence occupations. Therefore, this report utilizes real-time job posting information from employer job advertisements to approximate demand for artificial intelligence-related jobs.

Currently, there is no similar program in the state, and based on the available data there **appears to be a supply gap for artificial intelligence for business-related workers in the region.** However, it should be noted that the majority of jobs require at least a bachelor's degree. Therefore, **the COE cautiously endorses this proposed program.** Reasons include:

Demand:

- Over the last twelve months, there were **5,517 online job postings** for artificial intelligence-related jobs. **Entry-level positions account for 442 (8%)** online artificial intelligence-related job postings.
- The highest number job postings were for data engineer, data scientist, and software development engineer.
- Of the 442 entry-level job postings, 75% listed a minimum education requirement. The majority of job postings were looking for job candidates with a bachelor's degree. **Only nine entry-level job postings were looking for individuals with an associate degree.** Common entry-level job titles include: data center technician, junior data engineer, systems engineer, and junior data analyst.
- Job postings for entry-level AI-related positions offer a strong wage for qualified candidates as nearly 75% (41) of job postings with wage information were offering wages above \$75,000 per year. Of the job postings with wage information, the mean real-time salary was \$98,000 and the **median real-time salary was \$103,000.**

Supply:

- **Eight community colleges** in the region provide training programs that may train for the jobs of interest – conferring an average of **130 awards annually** between 2016 and 2019.

¹ <https://hbr.org/2018/01/artificial-intelligence-for-the-real-world>

Job Postings: The following sections show how the employer job posting search was conducted using job titles frequently associated with artificial intelligence such as junior data scientist, artificial intelligence consultant, research scientist, artificial intelligence/machine learning engineer, and machine learning developer. Due to the technical knowledge needed to work in AI, workers in this field typically have at least a bachelor's degree. As a result, very few job openings are immediately accessible to community college graduates. Despite this, job postings for AI workers were separated into two groups, traditional AI job postings and AI job postings with the keyword entry-level, junior, or assistant to illuminate how job requirements for entry-level positions differ from experienced AI-related positions. NOTE: job postings seeking candidates with a master's or doctoral level degree have been excluded from this job posting search.

Entry-Level Artificial Intelligence Job Postings: Job posting data reveals that there is less demand for entry-level AI-related positions than for experienced workers, as these positions comprise only 8% (442) of the 5,517 total AI-related job postings over the last twelve months. The highest number job postings were for data center technician, junior data engineer, systems engineer, and junior data analyst. The top skills were: Python, SQL, data science, machine learning, and Java. The top three employers, by number of job postings, in the region were: Deloitte, Dell, and Disney. Of the 442 online job postings, 75% list a minimum education requirement.

Experienced Artificial Intelligence Job Postings: Over the last twelve months, there were 5,517 total online job postings for artificial intelligence-related workers. The highest number job postings were for data engineer, data scientist, software development engineer, and machine learning engineer. The top skills were: Python, SQL, data science, machine learning, and big data. The top three employers, by number of job postings, in the region were: KPMG, IBM, and Deloitte. Of the 5,517 online job postings, 59% list a minimum education requirement.

Educational Attainment — Of the 75% of entry-level job postings listing a minimum education requirement in Los Angeles/Orange County, nine requested an associate degree and 323 requested a bachelor's degree.

Of the 59% of job postings for AI-related workers listing a minimum education requirement in Los Angeles/Orange County, less than 1% (21) requested a high school diploma or vocational training, 1% (36) requested an associate degree, and 98% (3,205) requested a bachelor's degree.

Job Posting Salary Information — Approximately 12% (55) of employer job postings for entry-level AI-related positions contain wage information. Of these job postings, the mean real-time salary was \$98,000 and the median real-time salary was \$103,000. Job postings for entry-level AI positions offer a strong wage for qualified candidates as nearly 75% (41) of job postings with wage information were offering wages above \$75,000 per year. Please note that salary figures were prorated to reflect full-time annual wages.

Approximately 15% (837) of employer job postings for experienced AI positions contain wage information. Of these job postings, the mean and median real-time salary was \$120,000. On average, advertised salaries for experienced AI positions are \$17,000 more than entry-level AI positions. More than 89% (748) of job advertisements were offering wages above \$75,000 per year.

Supply

Community College Supply — Exhibit 1 shows the annual and three-year average number of awards conferred by community colleges in programs that may provide training for artificial intelligence-related field(s). Based on data below, community colleges with the most regional completions are Mt. San Antonio, and Long Beach. Over the past 12 months, there were no other related program recommendation requests from regional community colleges.

Exhibit 1: Regional community college awards (certificates and degrees), 2016-2019

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
0701.00	Information Technology, General	East LA	8	15	-	8
		LA Harbor	1	6	-	2
		LA Mission	4	1	1	2
		Long Beach	27	25	34	29
		Mt San Antonio	49	65	74	63
		Santa Monica	-	-	39	13
		West LA	3	4	4	4
		LA Subtotal	92	116	152	120
		Cypress	1	-	-	0
		OC Subtotal	1	-	-	0
			Subtotal/Average	93	116	152
0799.00	Other Information Technology	LA Harbor	1	1	-	1
		Mt San Antonio	9	5	13	9
		LA Subtotal	10	6	13	10
		Subtotal/Average	10	6	13	10
	Total/Average	103	122	165	130	

Appendix A: Sources

- Labor Insight/Jobs (Burning Glass)
- California Community Colleges Chancellor's Office Management Information Systems (MIS)

For more information, please contact:

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