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Examining Artificial Intelligence Job Descriptions: An Analysis of Current Job Postings

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Abstract

Artificial intelligence continues to transform the workforce. Educators, job seekers, and policymakers need to understand the changing needs of AI-related job roles. This study examines 435 AI job postings on PostJobsFree.com utilizing text mining techniques that include word frequency analysis, TF-IDF, Named Entity Recognition (NER), and Linguistic Inquiry and Word Count (LIWC). The analysis shows that the job posts are requesting a well-rounded skill set that includes both technical skills - such as Data Science and Natural Language Processing - with durable skills such as teamwork, communication, problem solving, and interpersonal skills. The most used words are AI, Data, and Team. TF-IDF displays more domain-specific words, such as Generative AI and AI Models. NER indicates the importance of tools (such as Python and AWS) and security clearances for DOD personnel. LIWC shows that the descriptions are extremely analytical and achievement oriented. These findings suggest that companies continue to value core technical proficiency while also looking for applicants who can work in complex, interdisciplinary environments. This study adds to the literature on AI labor market trends and provides insights into the AI industry's dynamic demands. In addition, this study can be used by both job seekers aiming for AI positions and employers seeking professionals in the AI field. The results can assist job seekers in identifying the necessary technical skills they need to develop to obtain specific AI jobs. Employers can use the result to have a better understanding of the essential skill sets to look for in candidates applying for AI related positions.

Keywords: AI jobs, Job applications, text mining, job market, AI, Artificial Intelligence

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Examining Artificial Intelligence Job Descriptions: An Analysis of Current Job Postings

Alan Peslak, Wendy Ceccucci, Kiku Jones and Margaret Wanjiku Gachau

1. INTRODUCTION

Artificial intelligence (AI) has become a transformative force across industries, reshaping workflows, decision-making processes, and organizational priorities. As companies increasingly seek to integrate AI technologies into their operations, the demand for skilled professionals in this field has surged. This demand is reflected in the job postings across various online platforms, where employers highlight the skills, qualifications, and roles required for AI-related positions.

PostJobsFree.com, a widely used platform for job advertisements, provides a unique opportunity to analyze trends in AI job postings. By examining these listings, it is possible to gain insights into the evolving requirements of the AI workforce, including the technical proficiencies and domain expertise that employers prioritize.

This paper aims to systematically review AI job postings on PostJobsFree.com to identify key trends and patterns in the field. The study examines job titles, required qualifications, preferred skill sets, and job descriptions to uncover the nuances of the AI labor market. Through this analysis, the paper seeks to provide actionable insights for educators, policymakers, and job seekers, enabling them to align their strategies with the dynamic demands of the AI industry.

2. LITERATURE REVIEW

Job Market Trends

The AI job market is experiencing unprecedented growth, with demand surging across multiple sectors including technology, healthcare, finance, and manufacturing. Recent data from UMD-LinkUp (2025) and the University of Maryland reveals a remarkable 68 percent increase in AI job postings in the United States, rising from 29,509 in 2022 to 49,577 by the end of 2024.

The World Economic Forum projects a significant reshaping of the global job landscape by 2030. Technological advances are expected to create

170 million new jobs while displacing 92 million, resulting in a net gain of 78 million jobs. This transformation underscores the critical need for comprehensive workforce training and education reforms to prepare workers for emerging roles.

AI is fundamentally reshaping the workplace, presenting a complex landscape of both opportunities and challenges. Technology has the potential to simultaneously automate routine tasks and create new roles requiring specialized AI expertise.

Generative AI offers promising opportunities for workforce empowerment. It could enable less specialized employees to perform more complex tasks, expanding the functional capabilities of roles such as accounting clerks, nurses, and teaching assistants. For skilled professionals like electricians, doctors, and engineers, AI can provide access to cutting-edge knowledge, dramatically improving problem-solving efficiency.

Researchers like Shen (2024) emphasize that the most beneficial technological developments will focus on enhancing human capabilities rather than simply substituting human labor.

The integration of AI into the workforce is creating a polarized employment landscape. While generating numerous new jobs, AI is also causing significant disruption, particularly in low-cost, labor-intensive sectors.

Key observations include:

- Increasing employment thresholds
- Widening income disparities
- Higher compensation for AI managers and experts compared to manual workers
- Automation technologies replacing repetitive and basic skilled roles

As noted by Shen and Zhang (2024), these technological shifts are fundamentally altering traditional labor market dynamics, presenting both challenges and opportunities for workers across various industries.

In the healthcare sector, AI has revolutionized diagnostics, drug discovery, personalized medicine through technologies like image recognition for disease detection, and the development of AI-powered prosthetics (Kolakowski, 2025).

In Finance, AI has transformed financial services through applications such as fraud detection, algorithmic trading, and personalized financial advice (Shen, 2024). AI is now being used in traditional financial activities such as customer collection, identification, risk management, investment advisory and customer service.

In Manufacturing, AI-powered robotics and automation are streamlining production processes, improving efficiency, and enhancing product quality (Shen, 2024).

From the perspective of the application of artificial intelligence technology, there will be many jobs set around AI in the future, which will produce more new occupations and new opportunities that are difficult to evaluate (Jepperson, 2025). The proportion of blue-collar workers will gradually decrease while the proportion of white-collar workers in the new knowledge economy will expand. Comunale and Manera (2024) conclude that occupations with high task exposure will face higher displacement, and exposed workers will see reduced employment opportunities.

Asim and Ding (2025) used Structural Equation Modeling with 500 professionals from various industry sectors, and found that artificial intelligence adoption creates measurable improvements in both workforce engagement and job performance outcomes. Additionally, their research identified job complexity levels and individual AI expertise as powerful moderating variables that can either strengthen or diminish these positive effects, indicating that both personal capabilities and work environment characteristics play decisive roles in determining how effectively organizations can harness artificial intelligence benefits.

Han, Chen Wand, and Xu (2025) conducted an online survey of 519 Chinese employees with AI experience. Using regression analysis they found that the use of AI positively enhanced innovative workplace behaviors through its ability to enable job crafting activities, with this effect being more pronounced among employees who possessed greater confidence in their creative abilities. The study also found that workplace environments emphasizing employee strengths served as a

positive moderating factor, amplifying the connection between job crafting practices and innovative behavioral outcomes.

The evolving technological landscape presents significant challenges for workers with limited skill sets. Professionals who possess only basic operational skills face heightened risks of:

- Potential unemployment
- Reduced income opportunities
- Displacement by intelligent engineering systems

As intelligent technologies systematically replace traditional employment roles, enterprises' human resource demands are expected to contract, creating substantial pressure on the job market. This transformation underscores the critical importance of continuous learning, skill development, and technological adaptability.

Skills and Qualifications in AI Job Postings

Generative AI technologies like ChatGPT are fundamentally reshaping creative industries, catalyzing the emergence of innovative professional roles that demand sophisticated technological understanding. This technological shift is creating unprecedented opportunities for professionals who can strategically leverage AI for content creation, design, and complex problem-solving across diverse sectors.

Employers are increasingly seeking hybrid talent with a skill set that combines:

- Technical capabilities such as data manipulation and training data development
- Strategic competencies including advanced problem-solving and strategic decision-making

According to research by Jepperson (2025), the AI revolution is driving substantial demand for professionals with expertise in:

1. Data analytics
2. STEM disciplines
3. Information technology

Organizations integrating AI are rapidly transitioning toward more educated and specialized workforces, with a particular emphasis on technical domains. Hazan, Madgavkar, Chui, Smit, Maor, Dandona and Huyghues-Despointes (2024) further highlight this trend, noting a significant increase in job postings requiring specialized skills like:

- Robotics engineering
- Advanced data analysis
- Complex system integration

The AI professional landscape requires a sophisticated and multifaceted skill set that exceeds the traditional technological boundaries. Technical competencies form the foundational framework for success in this rapidly evolving field, with programming languages like Python and R serving as critical tools for innovation.

Machine learning frameworks such as TensorFlow and PyTorch represent essential platforms through which professionals can develop and implement advanced computational solutions.

Data engineering knowledge has become increasingly important, reflecting the growing complexity of AI systems. Professionals must demonstrate advanced capabilities in data manipulation, analysis, and interpretation. This requires not only technical proficiency but also the ability to extract meaningful insights from intricate datasets using advanced visualization tools like Power BI and Tableau.

Cloud computing platforms including Azure and AWS have emerged as crucial infrastructure for AI development, necessitating strong familiarity and strategic implementation skills. These platforms enable scalable, flexible technological solutions that are fundamental to modern AI research and application.

Beyond technical skills, employers are placing increased emphasis on complementary professional attributes. The World Economic Forum's (2025) research highlights the critical importance of soft skills such as strategic problem-solving, advanced critical thinking, professional communication, and effective collaboration. These capabilities enable AI professionals to translate complex technological concepts into actionable business strategies.

Educational pathways for AI professionals have become increasingly specialized. Typical credentials include bachelor's degrees in computer science, master's degrees in AI-related disciplines, and doctoral research focusing on advanced technological applications. Emerging specialized roles like Generative AI Engineer, Computer Vision Engineer, and Remote AI Training Specialist underscore the field's growing complexity and segmentation.

Researchers like Shen (2024) emphasize that success in the AI ecosystem requires continuous learning and adaptive professional development. Professionals must consistently update their knowledge frameworks, cultivate innovative thinking, and maintain a dynamic approach to technological engagement. This involves not only mastering existing technologies but also developing the capacity to anticipate and integrate emerging computational paradigms.

The rapidly transforming labor market demands that AI professionals remain agile, proactively updating their skills to match evolving technological demands. This requires a holistic approach that balances deep technical expertise with broader strategic understanding, positioning professionals to navigate the complex and dynamic landscape of artificial intelligence.

3. THEORETICAL FRAMEWORKS

Labor market analysis theories and computational linguistics frameworks provide the foundation for this study. The application of text mining techniques in employment research is an emerging area of interest.

Text Analysis in Job Postings & Theoretical Framework

Prior research has used NLP techniques to analyze job postings for various fields. Text mining, sentiment analysis, and keyword extraction have been employed to understand employment trends and required skills.

Based on our goal of understanding the current AI job requirements, we have developed the following research questions.

Research Questions

1. What are the most frequently occurring words and phrases in AI job postings?
2. What insights can Term Frequency-Inverse Document Frequent analysis provide about distinguishing terms in AI job descriptions?
3. What key entities (e.g., organizations, technologies, skills) appear most frequently in AI job postings?
4. What psychological, emotional, and linguistic attributes are present in AI job postings as analyzed by LIWC?

4. METHODOLOGY

Data Collection

AI job postings were collected from PostJobfree.com. This source was used since it does not have restrictions on web scraping whereas other job boards such as Indeed and Ziprecruiter have specific prohibitions against web scraping in their terms of service. Tools used for data analysis included Wordstat 8, LIWC, and Voyant Tools.

Data Preprocessing

Text preprocessing steps included removing stop words, special characters, and irrelevant data. Tokenization and lemmatization were applied to standardize the text.

Analytical Methods

Five different methods were used to analyze the job descriptions.

1. Word Clouds

Word clouds are visual representations of frequently occurring words. In a word cloud, the size of each word corresponds to its frequency: the more often a word appears, the larger it is displayed. This visualization makes it easy to identify the most commonly used words.

2. Word and Phrase Frequency

Analyzing the frequency of the most common words and two- or three-word phrases helps to identify which terms and expressions appear most frequently in job descriptions. This method provides a clear understanding of the prevalent skills and requirements requested by employers.

3. TF-IDF (Term Frequency-Inverse Document Frequency)

The term frequency (TF) measures how often a word appears in a document. The Inverse Document Frequency (IDF) measures how rare or less common a word is. It is a term frequency measure which gives a larger weight to terms which are less common in the document set (Nguyen, 2014). This method "allows for common words that appear in many documents (like 'the' or 'and') to be assigned less weight, while more distinctive words receive higher weights, making TF-IDF a useful tool for identifying keywords and important themes within documents." (Fan & Qin, 2018). The result is a determination of the most distinctive words in AI job descriptions compared to other job postings.

4. Named Entity Recognition (NER)

"Named entity recognition is an important basic tool for information extraction, question

answering system, syntactic analysis, machine translation and other application fields, and plays an important role in natural language processing technology" (Chang, Zhang, Lv, Zhou, & Bai, 2022). As a result it has become an integral tool in text analytics research.

5. LIWC (Linguistic Inquiry and Word Count) Analysis

LIWC is a tool used by many researchers for understanding sentiment and many other linguistic characteristics of documents (Bahgat, Wilson, & Magdy, 2022).

It is used to assess and measure psychological, emotional, and linguistic dimensions, including tone, formality, and cognitive processes in AI job descriptions. LIWC is the software tool developed by Pennebaker.

5. RESULTS

1. Word Cloud Analysis

Figure 1 illustrates the 100 most frequently occurring individual words in the job descriptions through a word cloud. The prominence of AI and Data is evident, as they are the most commonly used terms. Additionally, the word cloud highlights other frequently mentioned words such as Team, Development, Learning, Business, and Support.

Figure 2 the most common phrases found in job descriptions through a word cloud. Artificial Intelligence and Machine Learning stand out as the most frequently used phrases, appearing significantly larger than the others. The next most prominent phrases include AI ML, and Computer Science which are noticeably smaller in comparison.



Figure 1: Top 100 Individual Words



Figure 2: Top 50 Phrases

2. Word and Phrase Frequency Analysis

As anticipated, AI is the most frequently occurring word, appearing 2094 times. Following closely is Data, with 1438 instances, and Team, with 982 instances. Table 1 lists the most common words that appear at least 500 times. The complete table of 100 individual words and their frequencies can be found in Appendix A. The phrases Artificial Intelligence and Machine Learning are the most frequently used, with 599 and 515 instances respectively. The third most common phrase is AI ML, which appears 265 times, notably much less often. The full table of most common phrases and their frequencies is available in Appendix B. Note that common EEO phrases were excluded in this table.

Individual Words	Frequency
AI	2094
Data	1438
Team	982
Development	838
Learning	815
Support	671
Business	641
Ability	620
Technology	611
Systems	605
Information	587
Including	582
Years	581
Solutions	578
Research	578
Job	573
Technical	572
Machine	548
Position	546
Technologies	513
Requirements	507
Science	504
Environment	502

Table 1: Frequency of Individual Words With at Least 500 Instances

3. TF-IDF Results

The TF-IDF analysis (Figure 3) surfaces domain-specific terms that are distinctively emphasized in AI job postings. High scores for "Generative AI" (139.5) and "AI ML" (201) underscore the increased demand for cutting-edge skills following the 2022–2023 surge in public awareness and use of tools like ChatGPT. This finding directly supports the narrative of "dynamic demands" within the AI industry, reflecting how quickly generative technologies have moved from research into practice.

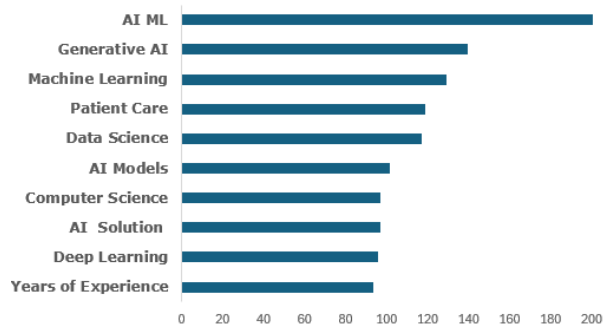


Figure 3. Top AI Job Description Terms by TF-IDF Score

Additionally, the presence of terms like "Patient Care" (119) and "Data Science" (117) suggests a significant overlap between AI and healthcare, as well as data-centric applications. Technical terms such as "AI Models", "Deep Learning", and "Computer Science" further emphasize the skillsets and knowledge areas critical to the field. Overall, TF-IDF scoring is effective for identifying terms that are both highly frequent in a specific context and relatively rare elsewhere, making them strong indicators of domain-specific language—in this case, uniquely associated with the AI workforce.

4. Named Entity Recognition (NER) Findings

NER analysis (Figure 4) reinforces these trends by highlighting specific technologies and organizational affiliations. Python, TensorFlow, and PyTorch feature prominently—common across machine learning stacks—while Azure and AWS suggest a strong orientation toward cloud-native AI deployment. This supports the view that AI job roles now demand "full-stack" proficiency: from programming and model training to cloud integration and deployment.

Furthermore, the frequent mention of "DoD", "SCI", and "Security Clearance" reflects the unique demand for AI professionals in defense and government sectors, particularly for roles

requiring advanced clearance. This implies that national security applications of AI are a growing employment segment, which carries implications for both technical preparedness and citizenship eligibility.

Together, the TF-IDF and NER results confirm that AI hiring reflects a dynamic and integrated skills economy—one in which deep technical fluency must coexist with security compliance, interdisciplinary understanding, and deployment readiness.

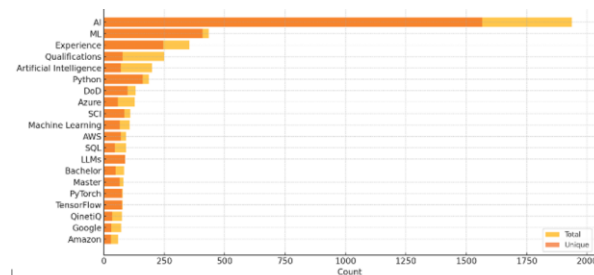


Figure 4. Top 20 Entities by Total and Unique Mentions

5. LIWC Analysis

The composite LIWC analysis of 436 AI job descriptions reveals a communication style that is highly structured, confident, and performance-driven. The **Analytic** score is exceptionally high (mean = 93.44), indicating logically organized, formal text, while the **Clout** score (75.49) reflects a commanding and authoritative voice. Despite this assertiveness, the **Authentic** score is low (19.28), suggesting that the language is impersonal and detached—typical of standardized, professional postings. A high **Tone** score (84.23) signals a generally positive emotional valence, likely used to attract applicants while maintaining a formal tone. Linguistically, the descriptions are complex, featuring high usage of six-letter words (40.82%) and elevated words-per-sentence (26.98), reflecting a sophisticated and technical vocabulary. The psychological dimension of these postings emphasizes cognition and achievement: scores are high for **Cognitive Processes** (9.94), especially **Insight** (3.81) and **Cause** (2.55), and for **Achievement** (5.51) and **Work** (13.14), underscoring the intellectual and goal-oriented nature of AI roles. In contrast, **social** references (7.16) and **personal pronouns**—especially first-person “I” (0.03)—are used sparingly, indicating a depersonalized, objective style with limited interpersonal or community language. Emotional expressiveness is tightly restrained, with minimal **negative emotion** (0.56), **anxiety** (0.13), or **anger** (0.09), reinforcing a composed and positive

narrative. Temporal focus centers on the **present** (5.10), with relatively little emphasis on **past** (0.46) or **future** (1.07), further suggesting an emphasis on immediate performance rather than historical experience or long-term vision. Overall, AI job postings construct a professional persona that is analytical, upbeat, intellectually demanding, and achievement-focused, while downplaying emotional tone, personal expression, and social connectedness—strategically aligning with the technical rigor and high expectations of roles in artificial intelligence.

6. DISCUSSION

Interpretation of Findings

Analyzing the most frequently occurring words and phrases, along with their frequencies, reveals trends in the expected and required technical and durable skills for job applicants. While it is unsurprising to see terms like AI and Data frequently mentioned, other technical skill words such as Development (838 instances), Engineering (484 instances), Models (474 instances), Program (312 instances), and Cloud (245 instances) highlight the technical expertise employers are seeking. Additionally, common phrases provide further insight into the specific technical skills required: Computer Science (227 instances), Data Science (172 instances), Generative AI (162 instances), Deep Learning (124 instances), and Natural Language Processing (79 instances, with Natural Language appearing uniquely 14 times).

Beyond technical terms, other words like Team (982 instances, with Teams appearing 340 times), Business (641 instances), Research (578 instances), Management (485 instances), and Analysis (303 instances) paint a broader picture of the qualities expected from applicants. These words suggest that employers are looking for candidates with a well-rounded skill set. This is further supported by phrases such as Communication Skills (124 instances), Problem Solving (111 instances), Cross Functional (107 instances), Interpersonal Skills (83 instances), and Solving Complex Problems (81 instances).

Implications for Researchers

The linguistic analysis of AI job descriptions has several important implications for both researchers and practitioners. For researchers, the consistent use of highly analytical, impersonal, and achievement-focused language raises questions about how such communication styles might influence perceptions of AI roles and contribute to patterns in applicant self-

selection. The minimal use of personal pronouns, emotional expression, and social references suggests a depersonalized tone that could deter candidates who prioritize collaboration, inclusivity, or emotional intelligence. This opens opportunities for further research into the framing effects of job language on different demographic groups, and whether such language reinforces existing gender or diversity imbalances in the tech workforce. Researchers may also explore how linguistic markers like cognitive complexity and goal orientation reflect broader cultural norms in AI-related fields and how they compare to other domains.

Implications for Practitioners

These findings can serve as a valuable resource for both job seekers aiming for AI positions and employers seeking AI professionals. Job seekers can leverage these findings to gain a clearer understanding of the qualities and skills employers are currently prioritizing. With this insight, they can identify which technical skills they need to develop before beginning their job search. Additionally, recognizing that employers value more than just technical expertise will help job seekers highlight their durable skills, presenting themselves as well-rounded candidates.

For employers, reviewing these findings can provide a comprehensive understanding of the essential skills required for AI positions. This ensures they do not overlook any critical components of the skill set necessary for success in the role. These findings will help employers avoid the consequences of focusing solely on technical skills, enabling them to seek candidates with a balanced mix of technical and durable skills.

Additionally, these findings point to the need for more balanced job descriptions. While the current emphasis on confidence, technical skill, and achievement is aligned with performance expectations, it may unintentionally limit the appeal of these roles to a narrow segment of applicants. Incorporating more authentic, inclusive, and people-oriented language could broaden the talent pool and better reflect collaborative and human-centered workplace values. Additionally, re-evaluating how work intensity and expectations are framed can help ensure job ads don't inadvertently suggest high-pressure or unsupportive environments. Ultimately, aligning the tone and content of job descriptions with both organizational values and evolving workforce expectations can support more effective and inclusive recruitment in the AI field.

7. Limitations and Conclusions

Limitations

The major limitation of this study is the relatively small sample set. This was due to download restrictions from postjobsfree.com. Further analysis with larger datasets is suggested to confirm our findings.

Future Research Directions

Future researchers should aim to expand this analysis by collecting job descriptions from global job markets, including those in different languages. Expanding the scope of the analysis could allow for the integration of data to identify the most critical skills worldwide. Additionally, comparing job descriptions from various countries might reveal whether similar priorities are shared globally.

Incorporating sentiment analysis into future research could provide insights into the tone of job postings, offering a deeper understanding of how job descriptions are framed. This could help employers as they are creating their job descriptions to convey their intended message rather than risk misunderstandings in what they are putting in the descriptions.

Lastly, employing deep learning models for advanced classification of job descriptions would enhance the understanding of different AI position segments and the specific skill sets required for success. This knowledge would help job seekers identify the roles best suited to their skills and enable employers to craft job descriptions that more accurately reflect their candidate requirements.

Conclusion

This study provides key insights into AI job postings using text analysis techniques. The findings contribute to AI labor market research and computational linguistics, highlighting the evolving nature of AI job descriptions. Generative AI being highly weighted aligns with the post-ChatGPT surge in interest for that skillset and the prominence of cloud platforms and ML frameworks in entities confirms how AI roles now demand full-stack implementation abilities.

Disclaimer

The authors generated parts of this paper including in the introduction and literature review with assistance from GPT-4, OpenAI's large-scale language-generation model. Upon generating draft language, the author reviewed, edited, and revised the language to their own

liking and takes ultimate responsibility for the content of this publication (OpenAI Publication Policy, 2022)

8. REFERENCES

- Asim, M. & Ding, W. (2025). AI Usage, Employee Engagement, and Work Performance: Examining the Roles of Job Complexity and AI Knowledge *Proceedings of the 2025 4th International Conference on Big Data and Digital Management*, 191, 294 – 303. [pphttps://doi.org/10.2991/978-94-6463-710-6_34](https://doi.org/10.2991/978-94-6463-710-6_34)
- Bahgat, M., Wilson, S., & Magdy, W. (2022). LIWC-UD: classifying online slang terms into LIWC categories. 14th ACM Web Science Conference 2022, 422-432. <https://doi.org/10.1145/3501247.3531572>
- Chang, L., Zhang, R., Lv, J., Zhou, W., & Bai, Y. (2022). A review of biomedical named entity recognition. *Journal of Computational Methods in Sciences and Engineering*, 22(3), 893-900. <https://doi.org/10.3233/jcm-225952>
- Comunale, M. & Manera, A. (2024). The Economic Impacts and the Regulation of AI: A Review of the Academic Literature and Policy Actions. (n.p.): International Monetary Fund.
- Fan, H. & Qin, Y. (2018). Research on text classification based on improved TF-IDF algorithm. *Proceedings of the 2018 International Conference on Network, Communication, Computer Engineering* <https://doi.org/10.2991/ncc-18.2018.79>
- Han, X., Chen, F., Wang, H., & Xu, S. (2025). Unlocking innovation: Artificial intelligence usage and innovative behavior in the workplace. *Social Behavior and Personality: An international Journal* 53(3). <https://doi.org/10.224.sbp.13851>
- Hazan, E., Madgavkar, A., Chui, M., Smit, S., Maor, D., Dandona, G., & Huyghues-Despointes, R. (2024). A new future of work: The race to deploy AI and raise skills in Europe and beyond. McKinsey Global Institute. Retrieved March 27, 2025 from <https://www.mckinsey.com/mgi/our-research/a-new-future-of-work-the-race-to-deploy-ai-and-raise-skills-in-europe-and-beyond>.
- Jepperson, T. (2025). How Is Artificial Intelligence Impacting the Job Market? LINQTO. Retrieved March 27, 2025 from <https://www.linqto.com/blog/how-is-artificial-intelligence-impacting-the-job-market/>
- Kolakowski, N. (2025). AI Job Market 2025: Trends and Opportunities Across the US. Dice. Retrieved March 27, 2025 from <https://www.dice.com/career-advice/artificial-intelligence-a-i-job-market-small-but-growing-in-many-states>
- Nguyen, E. (2014). Chapter 4 – Text Mining and Network Analysis of Digital Libraries in R, Editors Zhao, Y. & Cen, Y., Data Mining Applications with R, Academic Press <https://doi.org/10.1016/B978-0-12-411511-8.00004-9>.
- Shen, Y. (2024). Artificial Intelligence and the Economy . The Impact of Artificial Intelligence on the Job Market, *Advances in Economics Management and Political Sciences*, 92(1) 71-74. <https://doi.org/10.54254/2754-1169/92/20231275>
- Shen, Y. & Zhang, X. (2024). The impact of artificial intelligence on employment: the role of virtual agglomeration. *Humanities Social Sciences Communications*, 11(122). <https://doi.org/10.1057/s41599-024-02647-9>
- UMD-LinkUp AIMaps (2025). Tracking where AI jobs are being created. University of Maryland. Retrieved March 27, 2025 from <https://www.aimaps.ai/>
- World Economic Forum. (2025). Future of Jobs Report 2025. Retrieved March 27, 2025 from https://reports.weforum.org/docs/WEF_Future_of_Jobs_Report_2025.pdf?_gl=1*1gzrggi*_up*MQ..*_gs*MQ..&clid=Cj0KCQjw-e6-BhDmARIsAOxxlxVEsX6hUGqzyeDxVx0-3zQdyIcGqsNwLW9c7e3T599mAJi2YRZfxFQaAoDpEALw_wcB

Appendix A: Top 100 Most Common Individual Words

Individual Words	Frequency
AI	2094
Data	1438
Team	982
Development	838
Learning	815
Support	671
Business	641
Ability	620
Technology	611
Systems	605
Information	587
Including	582
Years	581
Solutions	578
Research	578
Job	573
Technical	572
Machine	548
Position	546
Technologies	513
Requirements	507
Science	504
Environment	502
Engineering	494
Provide	490
Required	488
Related	486
Management	485
Models	474
Design	468
Company	467
Knowledge	453
Role	442

Individual Words	Frequency
ML	441
Employment	436
Status	422
Software	422
Qualifications	418
Strong	414
Security	409
Opportunity	407
Time	402
Develop	394
Computer	384
World	377
Process	376
High	371
Training	369
Degree	364
Quality	360
Tools	354
Professional	352
Complex	349
Working	344
Teams	340
Opportunities	335
Services	330
Patients	327
Ensure	325
Disability	324
Based	322
National	317
Across	314
Applications	314
Program	312
Range	310

Individual Words	Frequency
Patient	309
Expertise	308
Benefits	305
Analysis	303
Applicants	301
Field	291
Performance	283
Full	278
Equal	278
Products	278
Industry	277
Application	277
Mission	275
Education	270
Product	268
Gender	266
Problems	265
Level	264
Success	260
Employees	260
Deliver	255
Include	255
Stakeholders	254
Understanding	252
Marketing	250
Part	247
Operations	245
Cloud	245
Projects	241
State	240
Relevant	238
Customers	237
Language	235

Appendix B: Most Common Phrases

Phrase	Frequency	Phrase	Frequency
Artificial Intelligence	599	Job Description	109
Machine Learning	515	AI Models	108
AI ML	265	Cross Functional	107
Computer Science	227	Team Members	106
Data Science	172	AI Solutions	104
Generative AI	162	Team Of Professionals Who Deliver	95
Years Of Experience	155	Natural Language	93
Veteran Status	153	Preferred Qualifications	91
Patient Care	151	Fast Paced Environment	86
High Quality	150	Relevant Experience	84
Full Time	148	Interpersonal Skills	83
Related Field	141	Cutting Edge	82
Fast Paced	130	Ability To Work	81
Artificial Intelligence Ai	129	Masters Degree	81
Communication Skills	124	Solving Complex Problems	81
Deep Learning	124	TS SCI	81
Qualified Applicants	122	Security Clearance	80
Bachelors Degree	118	Degree In Computer Science	79
Complex Problems	114	Natural Language Processing	79
Problem Solving	111		