

Can Artificial Intelligence Execute an Entire Job Role Independently?

Literature Review:

1- THE FUTURE OF EMPLOYMENT: HOW SUSCEPTIBLE ARE JOBS TO COMPUTERISATION?

This paper discusses the impact of task automation on the American labor market and the extent to which it will positively and negatively impact individual income. It also examines the possibility of automating these tasks and jobs.

A comparison is made between the outcomes of performing these tasks by individuals and using robots or AI-based programs.

- The development of interactive methodologies and simulations for the automation of 702 separate jobs in the American market is discussed.
- A review of the impact of automation on job opportunities and the types of jobs at risk of being eliminated or staffed.
- A review of the types of jobs whose staff cannot be replaced using AI technologies and tools, such as creative professions or professions that require critical and complex decision-making.

Strengths points of the Research Paper:

1- Clarity and Transparency

The information contained in the paper is easy to understand for readers who are not experts in the field of technology and entrepreneurship.

The research also addresses transparency by relying on real information derived from reliable sources.

2- Focus on Skills, Not Just Professions

One of the topics addressed relates to the cognitive aspects required for each job, not just the job title.

Weaknesses points of the Research Paper:

1- Limitations of the Study and Lack of Comprehensiveness

The study was limited to the American market and employee incomes there, meaning the discussion was specific to this market only.

2- Data on the American Market

Each country has its own economic conditions, and therefore this study merely sheds light on this country alone.

2-Artificial Intelligence and the Future of Humans

The scientific article discusses experts' opinions on the future of humanity in general by the year 2030 and the extent to which they will be affected by artificial intelligence technologies and their application in various fields.

The most prominent question was: Will humans be able to live better lives by that year, or will the pressures and challenges they face increase due to competition for job opportunities with modern technologies?

General findings from the study

- The study focused on the progress made in the medical field using artificial intelligence technologies.
- Doubts about the security and privacy of information stored and processed about companies and work activities.
- Social justice in the distribution of job opportunities between humans and robots.

Strengths points of the Research Paper:

The diversity of opinions, as participants came from different cultural and social backgrounds, giving this document a great degree of comprehensiveness in extracting facts.

- The simple and complex wording of the texts allows non-specialists to understand all the narratives circulating in the research.
- A transparent and comprehensive analysis of all the opinions addressed, both positive and negative.

Weaknesses points of the Research Paper:

I noticed from the participants' opinions that the study relied more on future predictions than on current facts.

- Bias in the selection of participants, as they came from technical backgrounds, i.e., working in IT companies or within the same environment.

3- The Impact of AI on Job Roles, Workforce, and Employment: What You Need to Know

This paper discusses the implications of AI adoption on the labor market, in terms of task implementation procedures, their sequencing, and the areas affected by this development.

It also presents the new opportunities AI offers in exchange for jobs being abandoned or eliminated.

It also simulates how recommendations will be made to study the skills required in the future to ensure survival in the labor market.

Strengths points of the research paper:

- Clarity of ideas:
The text is fluid and understandable for non-technology and AI specialists.
- Persuasiveness:
By presenting real-life examples from the study participants.
- Suggested solutions:
After presenting the problems and obstacles, several helpful solutions were presented related to adapting to changes and practical training for transitioning to new tasks.

Weaknesses of the research paper:

- General information:
I noted the absence of detailed figures for the cases discussed, and there were no accompanying tables with cumulative analyses of the differences between developing and developed countries.
- Study bias:
The discussion didn't address the impact of automation or digital transformation on workers with non-creative or routine jobs.

4. Robot performs first realistic surgery without human help

- **Significance of the Study**

The study aims to demonstrate the extent of technological progress in the medical field, specifically in performing sensitive and delicate surgical operations using smart robots.

This is achieved by reviewing the Star system between 2016 and 2020.

It also examines the ethical issues related to the decisions made by the robot during surgery and the resulting liability.

Finally, it discusses the challenges facing robots as medical conditions and human bodies change.

- **Strengths points of the Research Paper:**

1. A clear chronology of the development of the Star system.

The paper presents the developments and achievements achieved by the robot with this system from the year of its launch to the present day.

2. Realism in presenting the information.

The paper discusses a case study of a surgical operation on a pig, which supports the credibility of the research.

3. Future Vision

A discussion of the future ideas and goals being worked on by the developers of this system with the aim of achieving better services and results in the future.

- **Weaknesses points of the Research Paper:**

1. The results of the operation are ambiguous.
2. The entire operation was performed on animals, and no detailed explanation was provided of the condition of those animals after the operations were performed by the robots.
3. Costs are unknown:
The cost of the operation isn't mentioned, these facilities and their ideal readiness, or the costs of conducting periodic maintenance or handling unexpected situations.

5. AI Models and Methods in Automotive Manufacturing: A Systematic Literature Review

- **Importance of the Research Study**

The research paper provides a detailed and comprehensive explanation of the latest artificial intelligence-based technologies used in the automotive and heavy-duty engine industries.

The study provides a detailed explanation of 84 research studies related to the same field, highlighting successful cases in automotive manufacturing plants and within the assembly and quality control departments.

It also discusses current and future challenges and obstacles hindering progress in this field.

- **Strengths points of the Research Paper:**

1. Extensive and comprehensive data

The researchers made a great effort to collect information by studying a very large number of research papers related to the field.

2. Accuracy and reliability of information

Detailed information was explained and provided on the mechanism of model distribution, neural network application algorithms, and the application of deep learning.

3. Future outlook

The research paper discussed current challenges and suggested future directions, such as improving models and improving data quality.

- **Weaknesses points of the Research Paper:**

1. Bias in presenting information

The study did not include academic databases such as the IEEE in selecting or drawing ideas from them.

2. Limited focus:

It focused on manufacturing without exploring the impact of AI on other aspects such as design or maintenance.

3. Critical analysis: Insufficient

It did not discuss in detail the reasons for the superiority of some models over others or the limitations of industrial applications.

A critical analysis of artificial intelligence applications and their impact on the labor market and vital fields.

After identifying the most important studies and research papers in the field of applying artificial intelligence in the industrial and medical fields, we realized from the above that artificial intelligence is capable of improving efficiency and quality in these heavy industries by automating tasks and adopting optimal quality assurance standards.

Regarding the health and medical field, there were ethical considerations and difficulties facing the presence of intelligent digital technology in these research and medical centers.

On the other hand, while artificial intelligence leads to the creation of new high-skilled jobs, it threatens low-skilled jobs, requiring effective retraining policies and ensuring human integration with machines rather than their complete replacement.

Connections

1. Quality of Services

Numerous studies have discussed that

Artificial intelligence works ideally in increasing the quality of services by offering suggestions and solutions to gain a greater number of customers in any company, whether it relies on tasks that can be automated in the office or in the automotive industry and assembly.

2. Speed of Implementation

Studies have discussed the possibility of executing tasks and providing services in record time compared to the human element in the past.

This has saved significant costs and effort, and led to studies of the possibility of

excellence in the American market in particular and working to provide new job opportunities for humans in the future, contributing in a cohesive and flexible manner with artificial intelligence technologies to provide the best.

3. Quality of Life

In studies related to automotive manufacturing and patient treatment, a large part of the discussion of robotic operating mechanisms was related to quality assurance and simulating all unexpected situations to ensure safety.

Conflicts between the findings:

1. Comprehensiveness and Ambiguity

In the various studies and websites i searched for the information concluded in this academic documentation, there was confusion about choosing the most appropriate ones , these studies ranged from vague to comprehensive and expansive.

2. Job Availability

Some studies discussed the possibility of moving forward alongside robots or intelligent software without affecting humans or increasing the unemployment rate.

Other research papers questioned the ability of robots to perform tasks completely autonomously.

3. Ethics of Artificial Intelligence

I previously mentioned the bias of some research papers in selecting information or the sources of information collection, analysis, and discussion.

Some papers discussed the reality of work in the American market or within American society only, as if all people on Earth lived in America or shared the same living conditions as American citizens.

Synthesis Matrix for Literature Review:

Study	Authors	Year	Research Design	Key Findings/Results
THE FUTURE OF EMPLOYMENT: HOW SUSCEPTIBLE ARE JOBS TO COMPUTERISATION?	Carl Benedikt Frey and Michael A. Osborne	2017	Experimental	- Approximately 47% of total US employment is at high risk of being automated in the next decade or two. - Jobs in transportation, logistics, office/administrative support, and production are particularly vulnerable due to advances in machine learning (ML) and robotics.
Artificial Intelligence and the Future of Humans	anna Anderson And Lee Rainie	2018	Experimental	63% of experts believe AI will enhance human capacities by 2030, improving quality of life. 37% fear AI will reduce human autonomy, agency, and well-being.
The Impact of AI on Job Roles, Workforce, and Employment: What You Need to Know	Robert Farrel	2022	Experimental	Net Job Opportunities AI will replace 75 million jobs but create 133 million new jobs by 2025,

				resulting in a net gain of 58 million jobs. By 2030, AI could create 20-50 million new jobs globally. Top Emerging Jobs • AI Coaches • Human-Machine Team Managers • AI Ethicists • Data Scientists
Robot performs first realistic surgery without human help	Justin Opfermann, Samuel Schmidgall and Axel Krieger	2025	Experimental	• First Autonomous Laparoscopic Surgery (2020) • Successfully performed fully autonomous intestinal suturing in a live pig, marking a world-first milestone in soft-tissue robotics. • Enhanced Precision & Reduced Human Intervention • 5.88 stitches per needle adjustment (vs. ~1 adjustment per stitch in manual

				laparoscopic surgery). • Submillimeter accuracy in suture placement, reducing leaks (a major complication in 20% of gastrointestinal surgeries).
AI Models and Methods in Automotive Manufacturing: A Systematic Literature Review	Christoph Mueller and Vitaliy Mezhuyev	2022	Experimental	• Several case studies demonstrated improved defect detection, predictive maintenance, and process automation due to AI integration. • Deep Learning (CNN, RNN) was the most frequently applied method, particularly for computer vision-based quality inspection. • Reinforcement Learning (RL) and Generative AI showed promising results in autonomous robotic assembly and design optimization, respectively.

Study	Methodology	Limitation
THE FUTURE OF EMPLOYMENT: HOW SUSCEPTIBLE ARE JOBS TO COMPUTERISATION?	- Gaussian Process Classifier (GPC) A machine learning model was used to estimate the probability of job automation. The model assessed 702 distinct occupations based on their susceptibility to computerization. - Data Source: O*NET Database The study relied on the U.S. Occupational Information Network (O*NET) for job characteristics,	- O*NET Limitations: The database may not fully capture emerging job roles or rapidly evolving skill demands. - Static Analysis: The study does not account for future job creation in response to automation (e.g., new AI-related roles).
Artificial Intelligence and the Future of Humans	Experts were asked to forecast whether AI advancements by 2030 would enhance human capacities or diminish autonomy and agency. Open-ended responses allowed for qualitative insights into both optimistic and pessimistic scenarios.	2030 is a speculative timeframe: AI advancements could evolve in unexpected ways (e.g., AGI breakthroughs, regulatory shifts). - Historical precedent: Past tech predictions (e.g., the internet's impact) have often been inaccurate.

The Impact of AI on Job Roles, Workforce, and Employment: What You Need to Know	The study employs a descriptive-analytical approach to examine AI's labor market effects, focusing on: 1. Secondary Data Synthesis 2. Qualitative Case Studies 3. Discussed solutions like lifelong learning programs and universal basic income (UBI).	• Lack of Primary Data • Narrow Focus on High-Skill Roles. • Developed-world bias: Solutions (e.g., UBI, reskilling) may not apply to informal economies or nations with weak education systems. • No cost/feasibility analysis: Proposed solutions , lacked funding or implementation plans.
Robot performs first realistic surgery without human help	The study evaluates the Smart Tissue Autonomous Robot (STAR) system's ability to perform autonomous surgeries through experimental trials.	• Animal Models Only: Pig anatomy differs from humans; outcomes may not translate. • Limited Procedure Scope: Tested only on intestinal suturing—not complex surgeries (e.g., cardiac, neurosurgery).
AI Models and Methods in Automotive Manufacturing: A Systematic Literature Review	• Provides comprehensive insights into AI applications in automotive manufacturing. • Highlights successful case studies and future challenges.	• Database Bias: Overreliance on ScienceDirect/Scopus; excluded IEEE. • Scope Constraints: Focused narrowly on manufacturing, omitting AI in R&D or logistics.

References

- [1] C. B. Frey and M. A. Osborne, “The future of employment: How susceptible are jobs to computerisation?” *Technological Forecasting and Social Change*, vol. 114, pp. 254–280, 2017. [Online]. Available: <https://www.sciencedirect.com/science/article/abs/pii/S0040162516302244>
- [2] J. Anderson and L. Rainie, “Artificial Intelligence and the Future of Humans,” *Pew Research Center*, Dec. 10, 2018. [Online]. Available: <https://www.pewresearch.org/internet/2018/12/10/artificial-intelligence-and-the-future-of-humans/>
- [3] R. Farrel, “The Impact of AI on Job Roles, Workforce, and Employment: What You Need to Know,” *Innopharma Education*, [Online]. Available: <https://www.innopharmaeducation.com/blog/the-impact-of-ai-on-job-roles-workforce-and-employment-what-you-need-to-know>
- [4] J. Opfermann, S. Schmidgall, and A. Krieger, “Robot performs first realistic surgery without human help,” *IEEE Spectrum*, May 21, 2025. [Online]. Available: <https://spectrum.ieee.org/star-autonomous-surgical-robot>
- [5] C. Mueller and V. Mezhyuev, “AI Models and Methods in Automotive Manufacturing: A Systematic Literature Review,” *ResearchGate*, 2022. [Online]. Available: https://www.researchgate.net/publication/364099113_AI_Models_and_Methods_in_Automotive_Manufacturing_A_Systematic_Literature_Review
-