Impact of AI on the Economy and the Labor market

Jannik Strobel

Friedrich Schiller University Jena

AI 2025 SUMMER SCHOOL
ai.uni-jena.de

Abstract

After the publication of ChatGPT 3.5, Large-Language-Models (LLMs) have gotten great attention by the public and have become synonymous with AI. But LLMs are just the newest addition to the AI transformation of the Economy and traditional Machine Learning, Deep Learning and other Artificial Intelligence Systems still play a big role.

In an increasingly digital world AI becomes increasingly powerful and important and leads to a new era of economic growth by increasing productivity and innovations.

But there are also new risks that come with AI. One of the most significant impacts of AI on the job market is the automation of routine and repetitive tasks. A study by the McKinsey Global Institute estimates that by 2030, up to 800 million jobs worldwide could be lost to automation. [4]

The extent of AIs impact on a particular profession can range from full automation to no change and is determined by a handful of factors that are correlated with the tasks of the profession itself and more general societal factors.

To successfully leverage AIs power, we need proactive policies, standards and regulations.

Economic benefits of Artificial Intelligence

AI adoption has shown a Significant positive effect on average long-run economic growth, which can especially be noticed in the last 20 years, because of the increasing quantity and quality of AI innovation over that time. [1] The effect of AI on growth is more robust among advanced economies. The economic growth can be attributed to AIs capability to raise productivity by automating routine tasks, improving how resources are allocated and enabling data-driven decision-making. AI's ability to analyze vast datasets and identify patterns that inform better
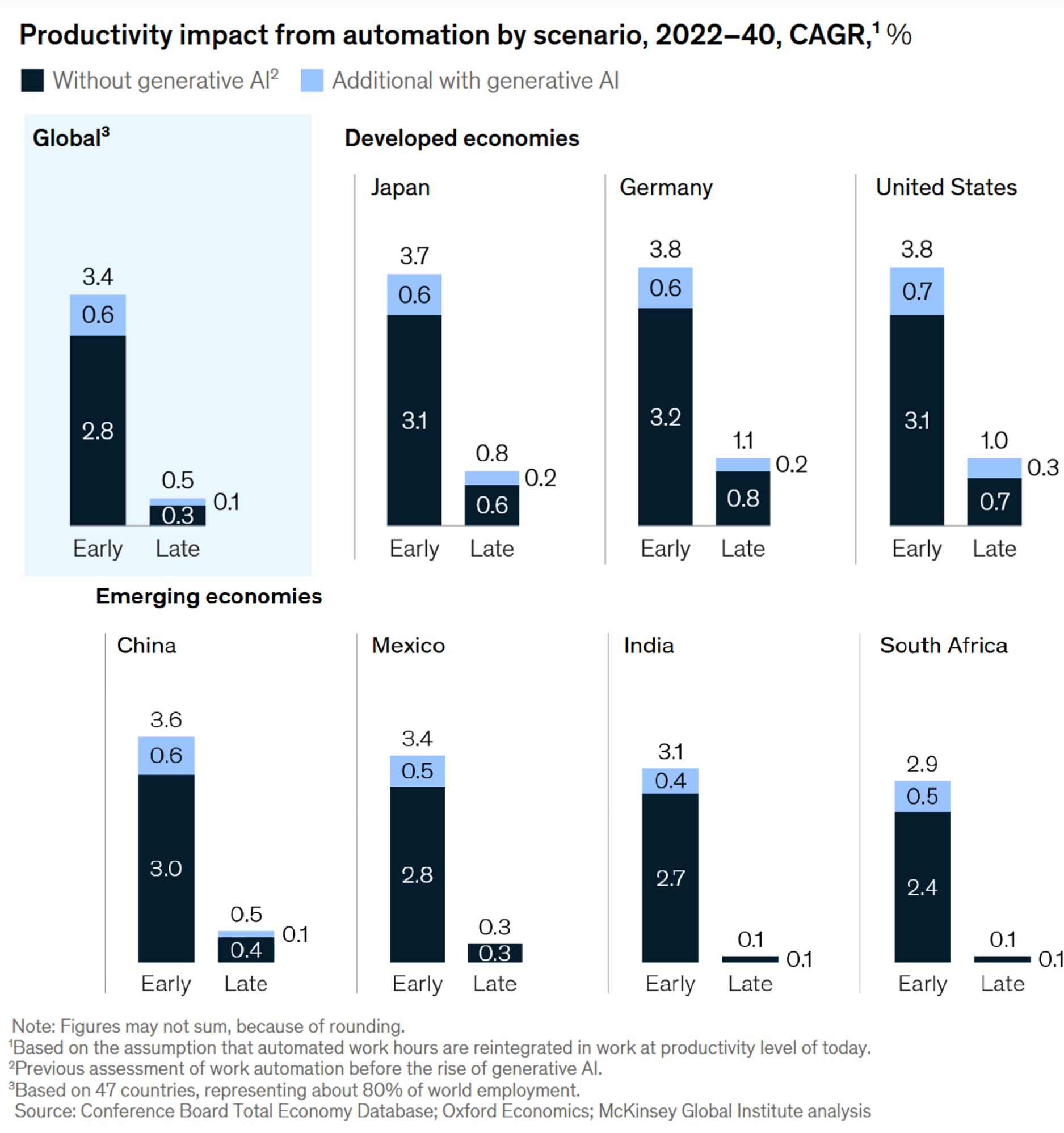

Figure 1: Compound Annual Growth Rate (CAGR) of GDP through increased productivity for a fast (early) and slow (late) adoption of AI and Automation technology [6]

decisions lead to better product quality through improved quality control and helps speed up product developing resulting in more innovation. AI also generates new job opportunities, particularly in industries where it augments human capabilities. When AI complements rather than replaces tasks, employees tend to see productivity gains and improved job satisfaction. [2][3]

Challenges and Concerns

As AI usage widens and improves productivity, product quality and innovation it also presents significant challenges and concerns:

Inequality: Because AI depends on infrastructure and specialized know-how, its deployment and benefits are unevenly distributed. Most research and innovation lie in advanced economies, risking a widening of global and domestic inequalities as automation shifts returns toward technology owners and away from displaced labor [1][2][4]

Data Privacy and Security:

AI systems depend on extensive datasets to function reliably. This reliance brings up important concerns regarding data privacy, security, and the potential for misuse. The collection and processing of personal data for AI Applications therefore pose risks to individual privacy and autonomy. [4]

Ethical Considerations:

AI decision-making is often

Figure 2: Fast and slow automation adoption scenarios for select countries in % [6]

opaque and hard to explain, which raises concerns about bias, algorithmic fairness, and accountability. Ethical debates persist about its use in high-risk areas such as autonomous weapons, facial recognition, and predictive policing. [4]

Employment: While artificial intelligence generates employment opportunities, it also threatens workers performing repetitive, routine and predictable tasks. This dynamic raises the concern of long-term structural unemployment and underscores the need for comprehensive workforce retraining. [2]
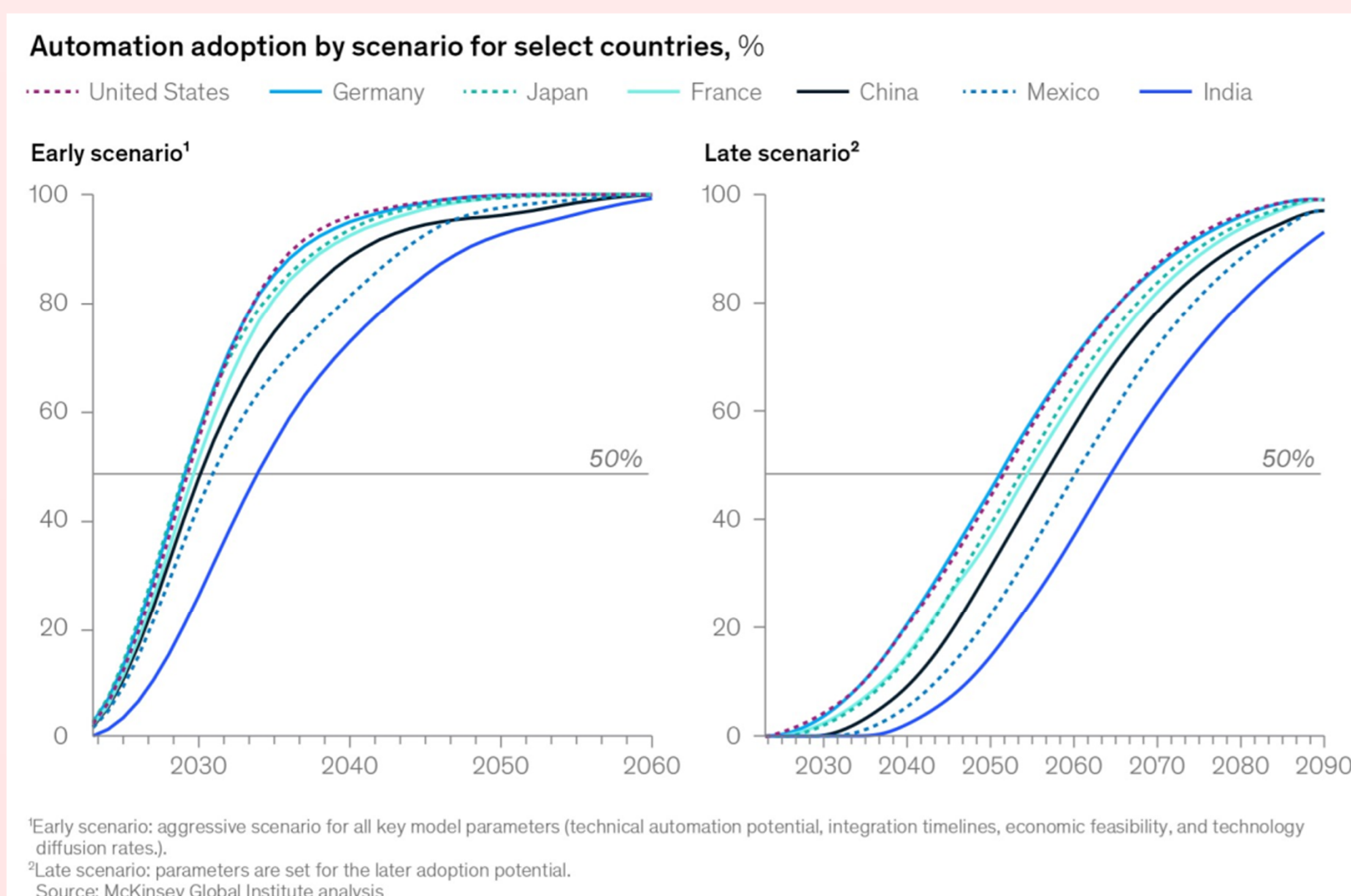
Key factors determining AIs impact on a profession

Some key factors can be found that determine how a profession will be impacted by AI: Will the profession be replaced, highly or little augmented by AI.

I divide between internal and external factors. Internal meaning factors, that are derived from the tasks, that come with the profession and external meaning factors that are depending on societal circumstances not directly correlated with the tasks of that profession. Internal factors describe how easy it is to automate the profession, while external factors express how big the incentive to automate the profession is.

Internal factors:

– Ethical/moral decision making -> Legal Sector
– Trust and legitimacy -> humans have to trust you, not just your work -> Politicians
– Social interaction -> The professions involves interacting with humans on a social/emotional level -> Healthcare, Social care
– Manipulation complexity -> How complex is it to manipulate objects associated with the profession -> Craftsmanships like Woodworker, Car mechanic
– Changing/uncertain environment -> Craftsmanships like Plumber, Electrician, Firefighter
– Complex reasoning -> Researchers, Doctors
– Remoteness/challenging environment -> Deep sea divers, off-shore wind turbine mechanic
– Creativity (Currently there is no scientific consensus if AI can produce truly novel ideas) -> Researchers, Artists
– Human-centric -> If a main point of the profession is that a human is doing it -> Athletes

External Factors

– Policies -> Is automation/augmentation incentivized or discouraged
– Societal moral of using AI -> If the society does not want AI to be used for that profession
– Cost to use AI -> Cost of training, inference and operating
– Labor Value -> How much value does the profession generate
– Demand -> How high is the demand for the profession or how many job positions are there
– Skill curve -> How hard is it to become good at the profession
– Human labor as a luxury -> It might become a status symbol to buy goods or services made by humans
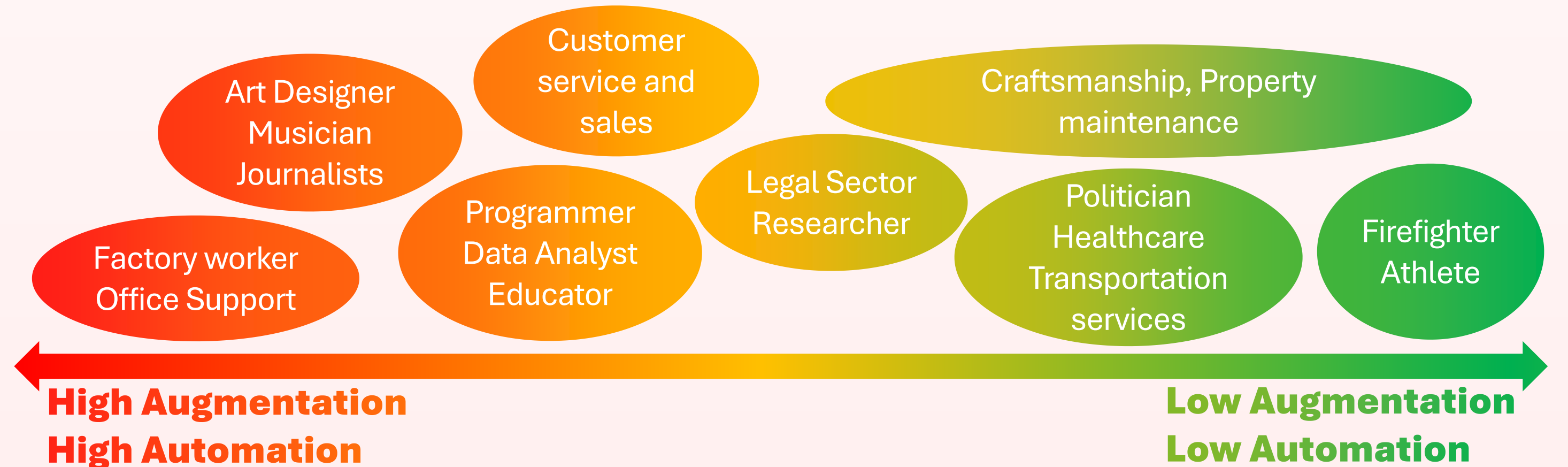

Figure 3: Grouping of professions and rough classification onto a spectrum from high augmentation/automation to low augmentation/automation. The classification depends on the mentioned external and internal factors of that profession. The length of the bubble can be seen as the range of automatability in which the profession falls into. Source: Created by the author

How can we benefit from AI while mitigating its risks

Artificial intelligence has the potential to completely transform our economy and society. But to benefit from AI to the fullest while mitigating the risks that come with it, we need proactive policy measures, guidelines, research and standards.

Education: The Workforce needs reskilling and retraining to get the essential skills that are necessary in an economy shaped by AI. This includes a reorientation of university and lower education to skills like critical thinking, creativity and STEM knowledge [4]

Collaboration: International Collaboration is needed to ensure that AI benefits are distributed globally and do not exacerbate existing inequalities between advanced and developing economies

Data Privacy: Policymakers must establish data protection regulations and promote best practices to protect user data

Ethics/Accountability/Transparentness: Ethical frameworks and regulatory standards are needed to ensure the development of transparent, accountable, and ethical AI system. These attributes are crucial to ensure that AI contributes positively to society without strengthening inequalities or violating individual rights

Inequality: Inequality in employment, income and wealth as a result of rising AI usage needs to be accounted for by policies like Universal Basic Income or AI/Robot Tax

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AI was used to find relevant scientific papers   Contact: Jannik.Strobel@mail.de