

Preface

Interest in artificial intelligence (AI) and robots has increased in recent years. There have been numerous studies on AI, robotics, employment, and labor, particularly from mid- to long-term perspectives, with various viewpoints—that these technologies improve productivity and create employment or that people will be deprived of work, the disparity in which is widening. This report investigates the state of adoption of AI and robotics, the state of investigations, and the issues that have arisen, and contributes to the discussion of employment and labor in a future AI, robotic society.

As it is difficult to cover all technologies relating to AI and robotics, nine research topics in three domains are focused upon. In part 1, “Research and Technological Trends,” addresses fields related to (1) knowledge and data processing (knowledge processing / machine learning, natural language processing, image acquisition and recognition), (2) the boundaries between humans and machines (speech interface, human–agent interaction), and (3) daily life and industry (robotics, IoT, multi-agent systems, and crowdsourcing). With regard to each technical topic, (1) presents notable social background, (2) presents technology trends in Japan and overseas, (3) focuses on applications to actual society and promising fields of application, and (4) details social issues and topics expected to arise in the future.

In the discussion of AI, robots, employment, and labor, workplace actors that should be considered range from technology developers to end-users; however, part 2 of this report, “AI Trends by Domain,” focuses on experts in each domain using AI and robots as tools for their work. Specifically, examples from Japan in eight domains are focused upon: (1) healthcare (doctors), (2) elderly care (care workers; however, it is important to note that the role families play is far from small), (3) art and design (creators), (4) education (teachers), (5) hospitality (customer service staff), (6) transportation / mobility (drivers), (7) agriculture (farmers), and (8) public order and security (police officers, security guards). Additionally, (a) AI applications for defense and national security overseas (military) and (b) trends in Japanese Chess *Shōgi* (*Shōgi* players) are also addressed as a column. This part treats technology as only one means of responding to social issues and focuses on interaction between technology and society. As such, each article in part 2 introduces (1) a broad perspective on the challenges facing Japan in each domain, (2) efforts taken by social institutions and policy to respond to these challenges, (3) usages of AI, robotics, and broader information technologies, and (4) ethical, legal, and social implications brought about by AI and robots, and issues that are difficult to solve solely by technology.

In part 3 “AI and Employment Overseas, and in Development, Utilization and Management of Human Resources,” the first half outlines policy trends rating for AI, robotics, and employment in US, EU, Germany, France, and China, and the second half introduces the state of technology and human resource growth, utilization, and control in Japan and overseas. This report was compiled through the repeated exchange of opinions among twenty-three authors of differing specialties and affiliations (informatics, engineering, sociology, anthropology, analytic philosophy, information ethics, law, and science technology studies), gathering and organizing information including interview surveys carried out in each field.