Robotics and autonomous vehicles

**What does it do?**

Robotics is a branch of computing and engineering that deals with the study of robots. It is an interdisciplinary mix of multiple fields of engineering such as mechanical engineering and electronics and electrical engineering with the combination of computer science required to program and operate these machines (May, 2017). Robots have many applications in different fields such as manufacturing, service, agriculture, healthcare and transportation. There are a variety of robots in service currently such as automated food production, advanced manufacturing of sensitive goods, providing automated service to customers and security (Ben-Ari & Mordechai, 2018). Robots are on the rise everywhere including at the local supermarket where cashiers are on the decline, at the local restaurant where robots are taking orders from customers and bringing food to the table and in the construction industry where robots are taking over a lot of the manual and dangerous work from humans such as bricklaying and many carpentry tasks such as sawing (Ben-Ari & Mordechai, 2018). One example of a robot that can perform carpentry work is the autosaw, developed by MIT university, which is able to use inputs to saw a piece of wood to the required dimensions and assemble furniture (Paez, 2018). An industry that is being revolutionised by the robots is the fast food industry with many robots in service in order to provide great quality food with less cost and effort. One example is the café X robot which is an automated barista which can produce two drinks in less than a minute and the flippy robot which is able to cook perfect beef patties and assemble it in a burger (Lee-Zogbessou, 2018). The next industry that is being revolutionised is the transportation industry with the rise in autonomous vehicles. Autonomous vehicles are vehicles that require little or no intervention from the driver to be able to be operated (Grover,2018). Because of the rapid pace of development of sensors, software and electronics, the development of autonomous cars was possible because the sensors and software are able to detect many of the hazards that are currently present on our roadways and calculate the required actions in order to operate the vehicle safely and deal with sudden situations and changes that occurs in the roadways. Within the next decade, we should see autonomous vehicles on our roads, primarily on our major highways (Grover, 2018). Currently the Australian government is working to make level 3 autonomous vehicles operational on public roads by 2020 (Australian Government Department of Infrastructure, 2019). Level 3 autonomous vehicles can control speed steering and monitor road conditions but require a fallback driver to take control (Grover, 2018). An ethical issue with autonomous vehicles is the legal implications of who is responsible for an accident of whether to blame the company or the owner of the autonomous vehicle (Belot, Piper and Kesper, 2018). The technological advances in sensors, electronics and software systems has allowed robots to rise very quickly and become a prominent part of our society where they are gradually becoming part of our daily lives. Robotics are revolutionising the society we live in already and we are in the wave of the fourth industrial revolution where the society we live in has been impacted greatly by the rise of robots that will change the way we operate as a society from jobs, recreation, tourism and education. How we operate and function as human beings will change as well from the rise of automation and robotics that will only become more prominent (Spiegel, 2018).

**What is the likely impact?**

With the current rise in robotics and automation, we are starting to see a lot of the jobs that are currently done becoming gradually and gradually extinct since robotic technology can do these jobs (Archer, 2018). The jobs most at risk from automation and robotics are jobs that repetitive, routine and require least creativity and innovation (Archer, 2018). Some examples of jobs that will be at risk is cleaner, cashiers, fast food cooks, data entry clerks, factory assembly and a lot of manual labour work in construction (Archer, 2018). With autonomous vehicles, a lot of jobs will be redundant in the transportation industry such as train drivers. However even though there is a lot of anxiety regarding the change of jobs and what we will do in the future, there is new jobs being created with the rise in robotics (Archer, 2018). These jobs require a high level of creativity, innovation and intelligence. These include automation engineers, computer research and development, mechatronic engineers, systems analysts, integration specialists, computer scientists and programmers required to develop effective software solutions to control robots (Archer, 2018). Some jobs that will survive the robotic revolution include graphic designers, financial consultants, managerial executives, game developers and careers that require high degrees of interpersonal intelligence such as the healthcare sector. With the change of jobs, the economy will also likely change as well with the rise in automation as well because new sectors will likely develop in the robotic age and the economy will start to embrace the boom in the rise of robotics from the development of robots to the production of robots as well (Gaskell, 2018). Also, education will also change as well because with the rise in robotics, new skills are likely to be required as well in order to keep up with the rise in robotics. One important skill that will likely be needed in the future is the ability to code across many different languages because in order to function, robotics require programmers that will develop effective software solutions for robotics (Blannin, 2017).

**How will this affect you?**

With the rise in automation and advances in robotics, our daily lives are being changed right here and right now (World Economic Forum,2019). One example in where automation and robotics are making an impact on our daily lives is the rise of the automated checkout machine which has effectively replaced many cashiers in a supermarket or a shop and in a restaurant, waiters are being replaced with robots that can bring food to the table (Lee-Zogbessou, 2018). Also, with the rise in robotics, people are being more creative and innovative since robots are taking over mundane tasks. Another way robot are effecting our daily lives is robots will eventually be part of our homes and our family because many companies are developing robots that are able to perform household tasks such as cleaning and are able to provide companionship to people. To survive the rise of robotics and the fourth industrial revolution people are beginning to develop skills that are future proof in the future (Purnama, 2018). Some of the most important skills that are future proof include creativity, problem solving and developing excellent interpersonal skills combined with emotional intelligence (Purnama, 2018). Interpersonal skills with emotional reasoning can’t be replaced by robots and creativity can’t be replaced by robots as well. Skillsets like these can ensure people will survive the 21st century (Purnama, 2018). However, there is a fear people with disabilities will be left out because of the limitations people with disabilities have since they often perform low level jobs, but there is a solution in education and employment to address this. There is a company called specilisterne which provides career opportunities in the technology sector for people on the spectrum (Specialisterne, Australia, 2019).

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