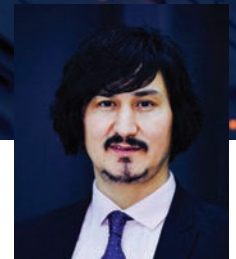


# AI

## NEW ERA OF AUTOMATION

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aidrivers

Automation can be traced as far back as 270BC when the Egyptians first used a float regulator for a water clock. Over the centuries, automation processes have entered many areas of life and helped power the industrial revolution from the 17th century. At the heart of automation is the desire to improve humanity by improving consistency, accuracy and productivity. In essence, making things easier to carry out.

Indeed, automation has become so integral to our lives that we take for granted our dishwashers, washing machines and traffic lights. Examples of automation are all around us alleviating the mundane, elevating levels of safety and freeing up precious time on a daily basis.

The capabilities of automation have been extended multiple folds through the invention of the computer. The rapid acceleration in the development of computing and its applications has led to the subsequent ubiquity of computerised systems. This has in turn greatly extended the ability to automate complex processes. In particular, engineers have sought to automate complex repetitive manual work so that tasks can be carried out smoothly

and efficiently without human error. This normally requires a huge amount of attention which creates stresses which lead to making mistakes and inefficiency.

Initially, the use of computerised systems to control automation was beset with many teething problems and created some unexpected new challenges and unanticipated down time. The early stages of development were also characterised by a lack of operational knowledge from designers which ironically made the delivery of secure and robust automated systems more difficult and more time consuming.

Roll forward to 2020 and after years of continuous technological development from talented and creative engineers, automation has reached a stage where it regularly and consistently delivers the specified operational requirements and, in many cases, goes way beyond this. Modern automation solves complex industrial challenges of WHAT situations efficiently and has created thousands of high paid careers whilst removing multiple thousands of low paid jobs. The World Bank's World Development Report in 2019 shows evidence that new industries and

jobs in the technology sector outweigh economic effects of work being displaced by automation. In economic terms there is much to be gained by automating.

However, despite the excellent results achieved from automation, in the majority of cases the automated systems are based on a rule-based approach and still lack cognitive processing ability. The most effective decision-making takes place when there is awareness of the situation and the ability to adjust to changing situations within that space. In addition, current automation is hugely dependent on the hardware, peripheral products and sensors without true cognitive which is creating new challenges. The outcome of this problem is that we currently have unsustainable long-term solutions.

### **AUTOMATION - NOT GOOD ENOUGH!**

Current levels of automation could be considered in the most critical sense merely 'good' at carrying out complex tasks safely and reliably. However, the next stage of automation will need to incorporate better decision making into the process to take account of our rapidly changing modern

world. This will extend the operational capabilities of current methods in place and crucially ensure new automation systems are able to respond to the constantly appearing and changing problems of modernity.

Automation currently lacks the cognitive processing capability needed to give a system a sense of self-awareness which would vastly improve procedures. There is also the restrictive issue of the dependency of most automated procedures on single systems whether software, machinery or other hardware. Another problem area is that automation programming has finite modes of operation which prevents agile responsiveness to in situ problems. Automation at present is quite simply not designed to adapt sufficiently at HOW situations instead deals with WHAT activities. One of the key elements of a successful new wave of automation will be the adaptability of the software which would be able to continue to learn to reflect and respond to any situation it faces and execute the appropriate commands as the problems arise. This will help bring about the next stage of productivity improvements of error free task completion.

Another huge hurdle to overcome in the current model of automation is that to put an automated process in place it is typical to adapt, at huge cost, the environment around the process to allow it to work thus it requires huge amount of environment preparation. This is not a sustainable method of work as we move into a world which holds green credentials at the top of the list.

Automation has not kept pace with the advancements in technology. There have been significant developments in the fields of sensors, computing power, Ai enabled algorithms and Ai driver models which are all capable of creating new operations cognitive and knowledge to handle much more complicated operational tasks in an uncertain world.

Tie all these issues together with the current low levels of productivity and the unsustainable amount of infrastructure change that is necessary to allow automation to work and it is abundantly clear that we urgently require a new era of automation to meet the need of industries and sustain the future.

### AI ENABLED AUTOMATION

Ai is the next advancement in technology that will accelerate the field of automation onwards to the next stage. Ai will allow the necessary learning to generate a new knowledge to understand different behaviours and evolve with new knowledge appropriate to the situation and environment. This is the obvious next layer



of advancement to ensure automation moves from its score card of 'good' to above and beyond.

The innovation of Ai has given a new dimension to learning. It has the capability and capacity to evolve by processing operations information and create new knowledge that humans may never have previously generated. One of the most commonly revered benefits of Ai is its ability to take large amounts of complex data and analyse the different permutations within and without a dataset that would otherwise take a human an unmanageable length of time. Incontrovertibly the jewel in the crown is the power of Ai to uncover and recognise hidden patterns.

An example of power of Ai layered into automation is the Ai driver algorithms which allow the design and development of new automation systems with cognitives and these can respond to a huge range of uncertain situations appropriately, promptly and safely. The element of human error is removed in a space without loss of cognitives which is expected to deliver heightened levels of accuracy. In addition, Ai enables us to develop a system and infrastructure independent solutions which overcome system dependencies such as supporting any type of sensors rather than being dependent on a particular model or make.

### FUTURE OF AI AND AUTOMATION

Ai enabled automation is the only approach which can meet the needs of future sustainability. This new version of automation will continuously learn from operations information to create a new knowledge to adapt to the environment. The ability to embed cognitive processing capabilities in an automated system will only enable further improvements to productivity and ongoing cost reductions. Ai enabled automation is self-aware, self-

adjusting and environmentally responsible for how situations in uncertain world.

We are heading into a new era of automation where its marriage to Ai will flex the work environment, shape processes and improve all areas of sustainability by continue evolving and creating new true knowledges. It will feel as exciting and revolutionary as the Egyptian float-regulated water clock twenty-four centuries ago and will become the driving force behind the current fourth industrial revolution.

### ABOUT THE AUTHOR

Aidivers' founder Dr Rafiq Swash of Brunel University London contributes to international research in Ai, visual information search and retrieval, computer vision, 3D sensors, predictive data analytics and automation. Professionally this has expanded into further international leading collaborations in connected robotics, Ai enabled automation, sensor intelligence and fusion, digitization and behaviour and pattern modelling.

### ABOUT THE ORGANIZATION

Aidivers provide specialised Ai enabled autonomous mobility solutions for port terminal automation that meet the needs of port operators. The company is working passionately to address industrial mobility challenges by optimising industrial operations and improving the quality of service towards a sustainable future.

### ENQUIRIES

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