



Nottingham Trent
University

School of Science and Technology

Automated Distribution and Manufacturing Centre

Professor & Academic Lead of Automated Distribution and Manufacturing Centre

May 2023

1. Introduction and context

The BEIS report (The Economic Impact of Robotics & Autonomous Systems Across UK Sectors, 2021) noted that productivity in the UK is lower than in many peer economies such as the United States, France and Germany, and has been particularly sluggish since the 2008/09 recession. Growth in labour productivity will be needed if growth in living standards is to be sustained, given that the UK has an ageing population and a low birth rate.

Productivity increases from robotics and autonomous systems (RAS) can help mitigate these challenges by reducing the number of human work hours needed to produce a given output, as well as by freeing up workers for higher value tasks. RAS also offers a number of potential wider benefits, including the development of adjacent technologies, the creation of jobs along the supply chain and increased resilience to exogenous shocks such as pandemics and extreme weather events.

A major challenge to the UK is that current adoption trends for RAS across sectors are generally not high enough to realise significant benefits, and there is a large gap between current forecasts of adoption and the maximum possible rate of automation. The UK's slow adoption of automation and a lack of action at a national level, is leaving entire regions of the country at risk of being left behind by G7 competitors. Regional differences would become further exacerbated if there were uneven levels of uptake of RAS across the country.

Towns Funding, part of the government's plan for levelling up the UK economy, has overarching aims to drive the sustainable economic regeneration of towns to deliver long term economic and productivity growth. Despite the D2N2 LEP area being seen as strong in advanced manufacturing, with more manufacturing jobs than any other LEP areas, places such as Ashfield have seen a continued shift away from manufacturing, a traditional strength, towards lower paid health and social care sectors. At the same time opportunities in distribution have increased enormously because of Ashfield's proximity to major cities and strategic road networks. The remaining manufacturing and increasing distribution sector has flagged that further support for RAS implementation is required.

Based on this, the Government has allocated Towns Funding (£20m funding plus £10m match) to Ashfield District Council to build an Automated Distribution and Manufacturing Centre (ADMC) to address this issue requirement. The ADMC is the centrepiece of Ashfield's investment plan to create a national centre of excellence and to help businesses become more competitive on the global stage. It will build upon the area's traditional strengths of manufacturing, embracing the potential threat of automation and leveraging Ashfield's prime location adjacent to the M1 for inward investment.

Based on a Catapult Centre model, the mission of the ADMC is to improve productivity and competitiveness by the adoption, integration and expansion of new automated technologies amongst local and regional businesses of all sizes and at all stages of development. It will also facilitate a range of programmes to skill, upskill and reskill local people. The anticipated impact of the successful Centre is more higher value jobs, a growth in higher skills, an enhanced reputation of Ashfield as a place to invest, and increased productivity and economic growth for the area.

The BEIS report shows that the scope of the ADMC is well targeted as warehouse logistics already has the highest RAS adoption rate (3.5 robots per million hours worked) of all relevant business sectors. It also has the highest projected growth rate, x10 by 2035. This could translate to labour productivity increases of around 23.3% and a 14% (£4.4 billion) increase in sector value-added by 2035. Indeed, this growth is less than one third of what could be achieved if its full automation potential was reached.

The ADMC aims to achieve its mission by directly addressing the barriers to RAS uptake, as informed by national reports and market insights. These include significant skills gaps and the need for industry engagement and “buy-in”. There are many technical challenges around interoperability and the need for greater flexibility. There is a major need to understand better what automation can do as well as how to access and integrate solutions, e.g. for small batch flexible manufacturing. This includes aspects such as data management and cyber security. There is also a lack of capacity within distribution and specialist manufacturing companies to absorb the introduction of automation within their facilities.

This insight leads to the ADMC’s objectives to be delivered through 4 pillars:

1. **Demonstration of Products.** Showcasing new and emerging equipment, that may not yet be available to see in reference sites.
2. **Testing of Equipment.** Suppliers and potential users can develop and test innovative solutions for client businesses, without compromising areas of the client facilities and staff resources. Strong focus on systems integration across the whole supply chain.
3. **Skills Development and Training.** Vision West Notts College and NTU will develop FE, HE and short courses to support the centre.
4. **Innovation and Emerging Technologies.** Automation for small lot production, low volume and high variety.

2. Establishing a research and innovation team

NTU will establish a research and innovation team in robotics and automation to be based in the ADCMC once it is built (with a scheduled opening of summer 2024). The team will support the adoption, integration and expansion of new automated technologies amongst regional businesses and so improve productivity and competitiveness.

The team will achieve this in two ways. Firstly, it will provide research and innovation expertise to address some of the key technological and system challenges of distribution relevant to large SMEs. These challenges, many of which have been outlined above in general, include: automating for small lot production linked to low volume and high variety; developing flexible automation systems that can handle multiple packaging sizes and shapes in a variety of environments; working with safe co-robotics for both manufacturing and distribution; creating databases of digital twins; undertaking 3D design, build and factory simulation; and undertaking physical simulation of goods-out process. This will make a major contribution to pillar 4 of the ADCMC's delivery programme consequently.

Secondly, the team will offer consultancy and skills development to advise RAS based solutions in response to the needs of individual companies. As part of this, it will also offer a suite of high-level micro-credentials to enable a better understanding of how RAS can benefit industrial users. Linked to this work, Pillar 3 of the ADCMC delivery programme will be supported.

The team will also provide support to the work which NTU delivers in conjunction with West Notts College at level 4-6, providing a direct link to the wider skills provision being made available to support the work of ADCMC from NTU.

The ADCMC presents a new way for collaborators to share in the spirit of creativity and curiosity that characterises NTU's research, scholarship, and practice, supporting the Valuing Ideas strands of NTU's strategic plan [University, reimagined](#), as does its focus on challenges that are as relevant to our stakeholders locally and regionally as they are of global concern. It also addresses the Enriching Society themes of the strategy where we have committed to "champion and support enterprises large and small to optimise their access to the capable leadership, skilled graduates and future facing technologies necessary to thrive". It also aligns with NTU's mission to drive regional economic growth through innovation.

The investment we are making augments NTU's capacity as a major player in the East Midlands Enterprise Universities' initiative to develop joint research and innovation bids in Digital Distribution. Its scope is also relevant to the planned East Midlands Freeport and associated planned East Midlands Development Corporation, which is expected to lead to large inward investment in manufacturing and distribution within the region.

The proposed team will also engage in the dissemination world-leading research and innovation so as to contribute to the transformation of "our international reputation through shaping a research narrative based on excellence and impact that generates esteem, stimulates collaboration and establishes opportunities."

The team will occupy 300 m² of the ADMC building (located at NTU's School of Science and Technology prior to ADMC opening) and consist of the Professor, two Research Fellows and a Technician. The team will gain critical mass from working with up to 10 existing researchers in NTU who are operating in areas related to robotics who have well established links with businesses looking at robotic and co-robotic systems, human robot interaction, intelligent mobile robot navigation strategies, and intelligent manufacturing and manufacturing process optimization.

3. Job description and person specification

Post title: Professor & Academic Lead of Automated Distribution and Manufacturing Centre
School or Department: Engineering
Title & Grade of posts line managed by postholder: Designated research and/or lecturing staff

Job purpose: To develop, lead and inspire research, scholarship and/or practice activity which enhances the profile and standing of the School and NTU, which in turn contributes to the furtherance of the School's operational plans and the University's strategic plan.

Principal duties and responsibilities: *At Nottingham Trent University, the job of Professor is aligned to one of three career pathways: Teaching and Research; Teaching and Scholarship; or Teaching and Practice. The majority of the duties in this job description apply to all three pathways. Any responsibilities which apply to a Professor within a specific career pathway are shown in italics with the pathway denoted.*

Research/Scholarly/Practice activity

- Undertake sustained high quality research, scholarly and/or pedagogic practice activity, consistent with the priorities of the School, which creates demonstrable impact upon the university, the external academic and/or professional communities and/or wider society.
- *Actively lead the development of quality research within Engineering, including the development of research in the Automated Distribution and Manufacturing Centre. This may also involve the active leadership, management and mentoring of research students and staff and early career researchers.*[Teaching and Research]
- *Actively lead quality professional practice and practice-informed teaching that develops the reputation of the University and its academics by creating a stimulating, effective environment for real-world student learning and attainment in the area of Automated Distribution and Manufacturing.* [Teaching & Practice]
- Maintain an international reputation for excellence within the discipline.
- *Maintain a sustained level of high quality research outputs in prominent peer-reviewed academic journals or other relevant fora recognised internationally in terms of originality, significance and rigour.* [Teaching & Research].
- *Design and deliver sustained excellence in practice-based teaching and learning and maintain a high level of outputs recognised internationally in terms of originality, significance and rigour.* [Teaching & Practice]
- Disseminate the results of research, practice and scholarly activity in academic and professional conferences, and contribute to the visibility of the University and School.

- Establish and maintain effective relationships with other academic institutions, relevant professional bodies, or commercial/industrial organisations to facilitate the development of research, teaching and/or pedagogic practice within the discipline.
- Maintain active membership of significant organisations, expert committees, boards and other bodies related to the discipline.
- Provide expert opinion to external organisations and audiences.
- As PI or Co-I successfully apply for, negotiate, and manage, high quality bids to secure research/grant/other external income at a level commensurate with the discipline and the relevant Band level of Professor.
- Initiate, lead and collaborate in research, scholarship and/or practice activities with other Universities and relevant partners outside of HE.
- Successfully supervise and manage research, scholarship and/or practice projects within ADMC and the School.
- Contribute significantly to the development and implementation of research/teaching and learning/practice strategy within the School, which results in demonstrable, measureable enhancements in capability, capacity and quality.
- Attract, recruit and supervise postgraduate students and/or postdoctoral researchers.

Teaching, Learning and Assessment

- Make a significant, sustained, contribution to the University as a teacher, tutor and facilitator of student learning.
- Develop and deliver inspirational, research-led or practice-led teaching that creates a stimulating environment for student learning.
- Contribute significantly to the development of the curriculum based on research, professional or consultancy expertise.
- Achieve consistently high student satisfaction, and a consistent number of successful research completions and Masters student dissertations/research projects.

Academic leadership and management

- To undertake full line management of all designated staff, including induction, mentoring, probation, absence management, teaching observation, PDCR appraisals, improving performance measures and disciplinary and grievance handling.
- To undertake academic leadership and management duties appropriate to the post across the subject area, providing support for colleagues as appropriate.

- To be responsible for ensuring that all University Policies and Procedures are appropriately applied and followed within the areas of responsibility of the post.

*In line with NTU Policy on the establishment of Research Centres and Institutes.

N.B. The post-holder may be required to undertake any other duties which may reasonably be required as within the nature of the duties and responsibilities of the post as defined, subject to the proviso that normally any changes of a permanent nature shall be incorporated into the job description in specific terms.

Personal Attributes		
Attributes	Essential	Desirable
Knowledge	<p>Internationally recognised with expert knowledge of automated distribution and manufacturing.</p> <p>Expert knowledge of research, academic and or pedagogic practice methods in the delivery and integration of infrastructure in a digital manufacturing, robotics, automation and process environments</p> <p>Advanced knowledge of national and international funding streams</p> <p>Substantial understanding of research applications and national and international impacts within the discipline.</p>	<p>Delivery and integration of industrial robotics systems and autonomous mobile robots (AMRs)</p>
Skills	<p>Proven ability to conduct, lead and manage internationally leading innovative research/ practice-based activity.</p> <p>Proven ability to develop, contribute to and implement a research/teaching & learning/teaching & practice strategy.</p> <p>Proven ability in teaching and facilitating student learning, with excellent undergraduate and postgraduate student/postdoctoral researcher supervision skills.</p> <p>Ability to develop sustained working relationships with external organisations</p>	<p>Ability to integrate a range of technologies and systems e.g., industrial robotics, corobotic systems, autonomous mobile robots and sensors, actuator integration</p>

	<p>including industry, academic/professional centres of excellence and institutes, ideally both nationally and internationally</p> <p>Excellent interpersonal, communication and networking skills.</p> <p>Proven leadership skills and ability to inspire, motivate, manage, mentor and coach students and staff.</p> <p>Proven ability to produce at least 4 high quality outputs within a 5 year period equivalent to REF 3* (internationally excellent) or 4* (world leading) for the relevant Unit of Assessment.</p>	
Experience	<p>Experience of conducting research/scholarship/practice activity that makes an impact on the internal research environment of an institution and building academic capacity.</p> <p>Evidence of contribution to the development and/or implementation of a research/teaching & learning/teaching & practice strategy.</p> <p>Experience of developing sustained relationships and collaborative working partnerships with colleagues and external organisations.</p> <p>Sustained track record of securing significant research income and/or external funding from diverse sources.</p> <p>Demonstrable experience of making a significant contribution as a teacher, tutor or facilitator of student learning, commensurate with practice within discipline.</p> <p>Experience of leading, inspiring and motivating researchers and mentoring junior staff.</p>	<p>Experienced in cross-academic and industry collaboration and working with senior representatives from industry</p>

	<p>Significant involvement in national and international conferences.</p> <p>Demonstrable experience of exceeding average individual income for the discipline and appropriate career pathway over a rolling 5 year period</p> <p>Sustained record of production of at least 4 high quality outputs within a 5 year period equivalent to REF 3* (internationally excellent) or 4* (world leading).</p>	
Qualifications	<p>A first/second degree/higher research degree in the relevant discipline</p> <p>A relevant postgraduate qualification</p> <p>Membership of a recognised professional body</p> <p>Fellowship of the Higher Education Academy (HEA)</p> <p>[Note: Newly appointed Teaching & Research Professors who do not already hold Fellow of Higher Education Academy will be required to achieve this within 12 months of appointment.]</p>	<p>A relevant professional qualification</p> <p>Chartered status</p>

Competencies

Essential Competencies

Communication and Influencing (Level 3)

Communicates effectively with a wide range of diverse internal and external stakeholders, influencing and negotiating change. Networks internally to keep ahead of developments

Organisation and Delivery (Level 3)

Takes account of organisational priorities to ensure that operational and strategic plans are being implemented and achieved.

Leading and Coaching (Level 3)

Is visible and publicly champions initiatives to provide direction. Takes responsibility for an area of work and for its outputs. Makes time to get to know people and motivate them. Regularly reviews performance of self and others

Creativity and Innovation (Level 3)

Reviews, tests and implements new concepts, models and approaches to practice in support of service development and delivery

Entrepreneurial and Commercial focus (Level 4)

Keeps up to date with the factors influencing the commercial context of Higher Education and actively seeks out opportunities for income generation, commercial exploitation, and to ensure that NTU retains a competitive edge within the sector.

Customer Focus (Level 3)

Provides a quality service that is regularly reviewed. Anticipates customer needs. Actively seeks feedback on services from customers and makes appropriate changes to services and to underpinning policy/strategy

Team Working (Level 3)

Leads aspects of team work, seeking and implementing improvements to the team's outputs/services and developing colleagues within the team. Challenges colleagues

Making Informed Decisions (Level 3)

Uses a wide range of complex data to take controlled risks to achieve greater gain. Uses trends and data to establish controls and performance indicators.

[N.B All competencies should be drawn from the NTU Competency Framework which can be found [here](#)]

Job Description and Person Specification created by (post title): Prof. Philip Breedon

4. How to apply

Anderson Quigley is acting as an advisor to the University. An executive search process is being carried out by Anderson Quigley in addition to the public advertisement.

Should you wish to discuss the role in strict confidence, please contact our advising consultants at Anderson Quigley.

Alicja Janowska on +44(0)7743 927 783 or alicja.janowska@andersonquigley.com;
Ed Pritchard on +44(0)7873 218 380 or ed.pritchard@andersonquigley.com.

The closing date for applications is **noon on Monday 26 June 2023**.

Applications should consist of:

- A full CV.
- A covering letter setting out your interest in the role and details of how you match the essential knowledge, skills and experience criteria of the person specification.
- Please include current salary details and the names and addresses of two referees. Referees will not be approached until the final stages and not without prior permission from candidates.

Completed applications should be uploaded at www.andersonquigley.com using the reference **AQ1887**.

Nottingham Trent University prides itself on being an inclusive employer. We value and celebrate equality in opportunities, and we welcome applications from people who reflect the diversity of our communities.